MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

AD-A151 714

CONTINUED DEVELOPMENT OF A DATA BASE
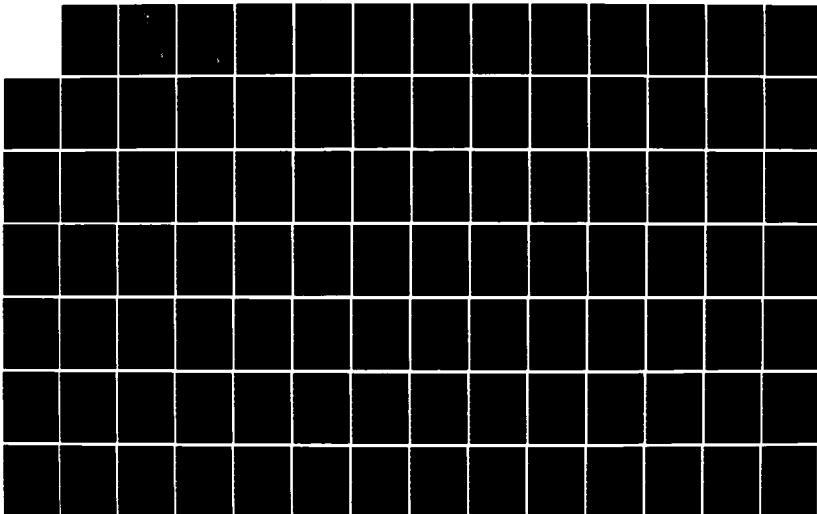MANAGEMENT SYSTEM PERFORMANCE MONITOR
VOLUME II

THESIS

Timothy D. Bruner
Captain, USAF

AFIT/GCS/ENG/84D-6

DTIC
ELECT
S MAR 28 1985
D

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

85 03 13 083

AFIT/GCS/ENG/84D-6

CONTINUED DEVELOPMENT OF A DATA BASE
MANAGEMENT SYSTEM PERFORMANCE MONITOR
VOLUME II

THESIS

Timothy D. Bruner
Captain, USAF

AFIT/GCS/ENG/84D-6

DTIC
ELF
MAR 28 1985
D

Approved for public release; distribution unlimited

AFIT/GCS/ENG/84D-6

CONTINUED DEVELOPMENT OF A DATA BASE

MANAGEMENT SYSTEM PERFORMANCE MONITOR

VOLUME II

THESIS

Presented to the Faculty of the School of Engineering

of the Air Force Institute of Technology

Air University

In Partial Filfillment of the

Requirements for the Degree of

Master of Science in Computer Engineering

Timothy D. Bruner, B.S.

Captain, USAF

December 1984

Appendix A

Functional Requirements

Table of Contents

A-1

Introduction

This appendix contains the functional requirements for the DBMS performance monitor.

FUNCTIONAL REQUIREMENTS

DBMS Performance Monitor

1.0 Establish a user interface to the monitor.

    1.1 Allow the user to select a set of performance parameters to be measured.

    1.2 Allow the user to specify and initiate the measurement collection process.

    1.3 Allow the user to inspect the status of the measurement collection process.

    1.4 Allow the user to gracefully terminate the measurement collection process.

    1.5 Allow the user to specify the types of statistical analysis to be performed on the measured data.

    1.6 Allow the user to specify how the measurement data is to be presented.

2.0 Measure the selected set of performance parameters.

    2.1 Create or initialize the data files and record the measurement data.

    2.2 Map the selected set of performance parameters to a measurement sources.

    2.3 Minimize monitor artifact by measuring and recording only the selected set of performance parameters.

    2.4 Start the measurement collection process at the specified time.

    2.5 Stop the measurement collection process at the specified time.

FUNCTIONAL REQUIREMENTS

3.0   Analyze the measured values for the performance parameters.

   3.1   Perform the necessary mathematical operations to obtain values for the performance parameters derived through calculations.

      3.1.1   Create an output file of the analyzed performance measurement data.

   3.2   Perform the necessary statistical analysis.

      3.2.1   Create an output file of the statistical analysis data.

4.0   Present the measurement data to the user.

   4.1   Create the performance report.

   4.2   Print the performance report - in as many copies as the user requires.

   4.3   Display the performance report on a terminal.

Appendix B

VAX 11/780 Hardware Configuration

Table of Contents

Introduction

This appendix contains the VAX 11/780 hardware configuration for the computer system used to implement the DBMS performance monitor.

VAX 11/780 Hardware Configuration

The hardware configuration for the VAX 11/780 at AFIT is shown in Figure B-1. The system contains 2.5 megabytes of main memory, two RK07 disk drives (each having a storage capacity of 28 megabytes), two RA81 disk drives (each with a storage capacity of 456 megabytes), two tape drives, six terminals, a line printer, and a laser printer. All peripheral devices are connected to the computer by the UNIBUS (4).
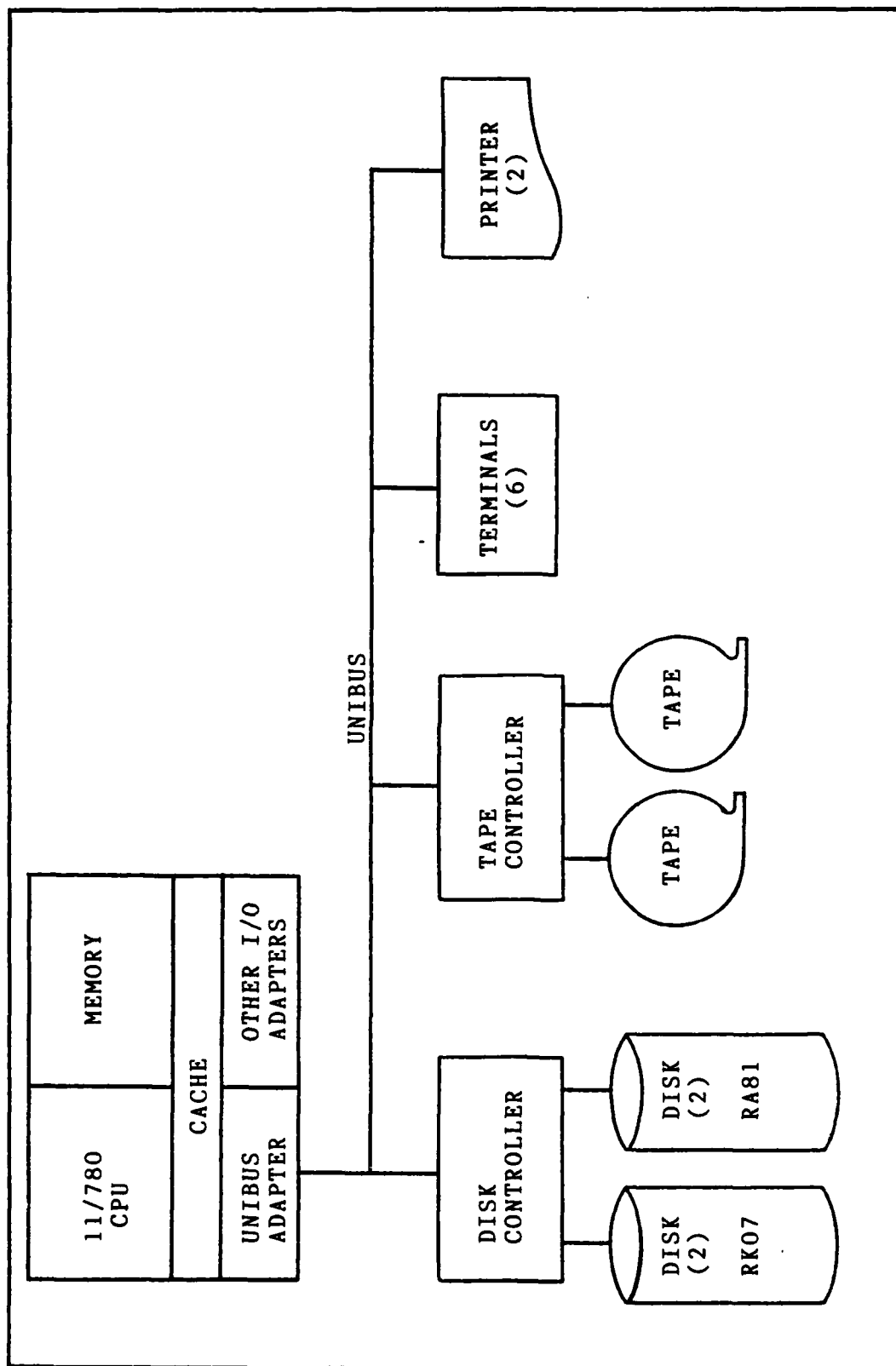
Figure B-1 VAX 11/780 Hardware Configuration

Appendix C

DBMON Perfomance Measures

Table of Contents

Introduction

This appendix contains documentation of the performance measures used in the DBMS performance monitor (1). The first table describes the performance measure and the second table provides the sources of the performance measure value.
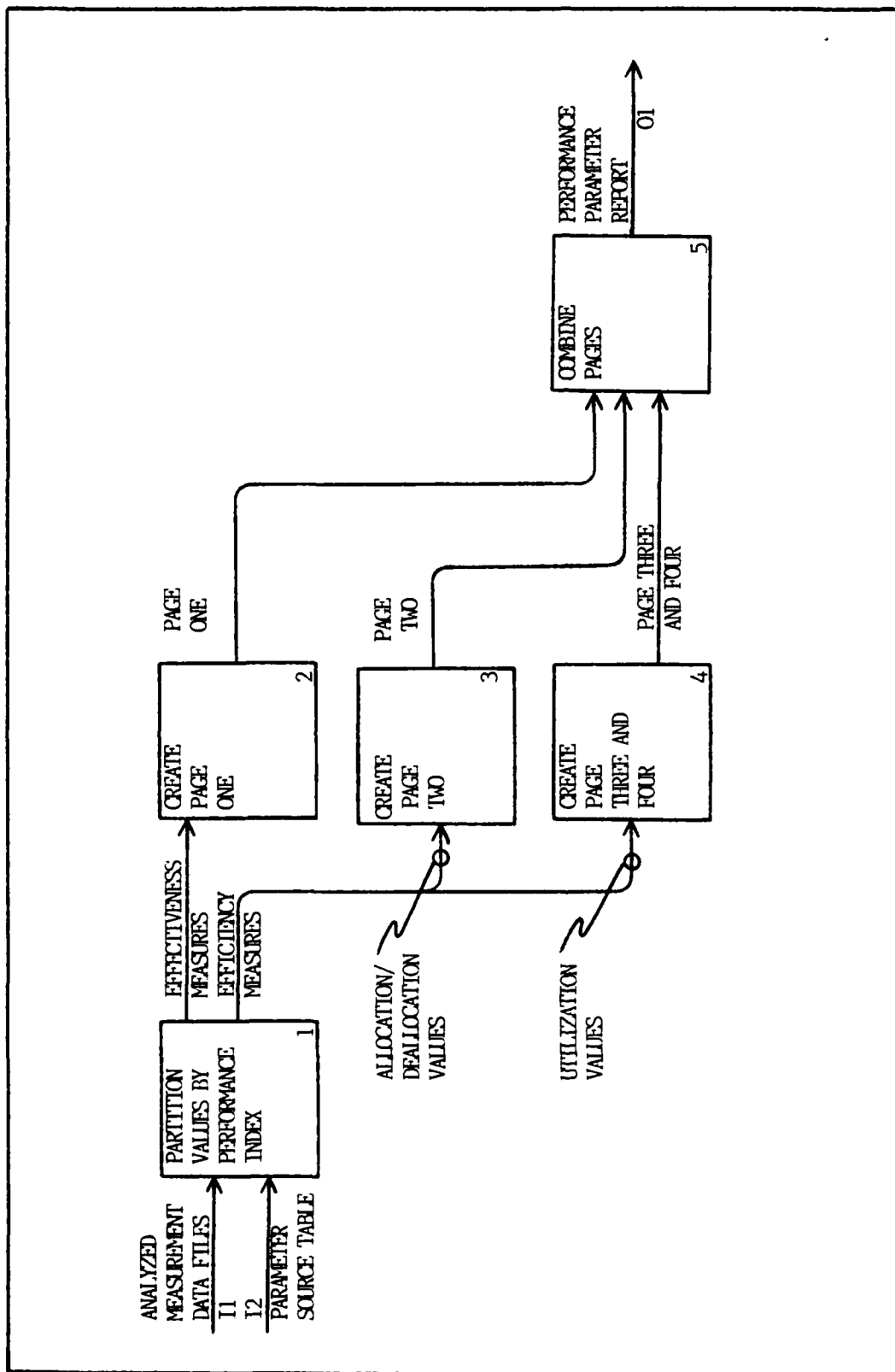
NODE: A41   TITLE: CREATE PERFORMANCE PARAMETER REPORT

A4   Present Performance Measurement Data to User

Abstract: This   activity   presents   the   performance
measurement data to the user of the monitor in the form of a
performance measurement report.

   A41   Create Performance Parameter Report - This activity
creates a report of the measured values for the performance
parameters organized by their corresponding performance
index and performance parameter name.

   A42   Present Performance Data to User - This activity
controls the presentation of the performance data to the
user of the monitor.

   A43   Display Page to User - This activity displays a
page of the performance measurement report on the screen of -
a terminal.   It allows the user to selectively view and/or
print the desired parts of the performance measurement
report.

   A44   Print Page - This activity will print a page of the
performance   measurement   report   on the printer of the
computer system.

ANALYZED
MEASUREMENT
DATA FILES
I2

PARAMETER
SOURCE TABLE

PERFORMANCE
PARAMETER
REPORT

CREATE
PERFORMANCE
PARAMETER
REPORT
1

C1 PRESENTATION
COMMANDS

PRESENT
PERFORMANCE
DATA TO
USER
2

STATISTICAL ANALYSIS FILES
I1

PAGING COMMANDS

TERMINAL PAGE

PRINTER PAGE

DISPLAY
PAGE TO
USER
3

C1
DISPLAY DEVICE
TERMINAL PAGE

PRINT
PAGE
4

PERFORMANCE
MEASUREMENT
REPORT
O1
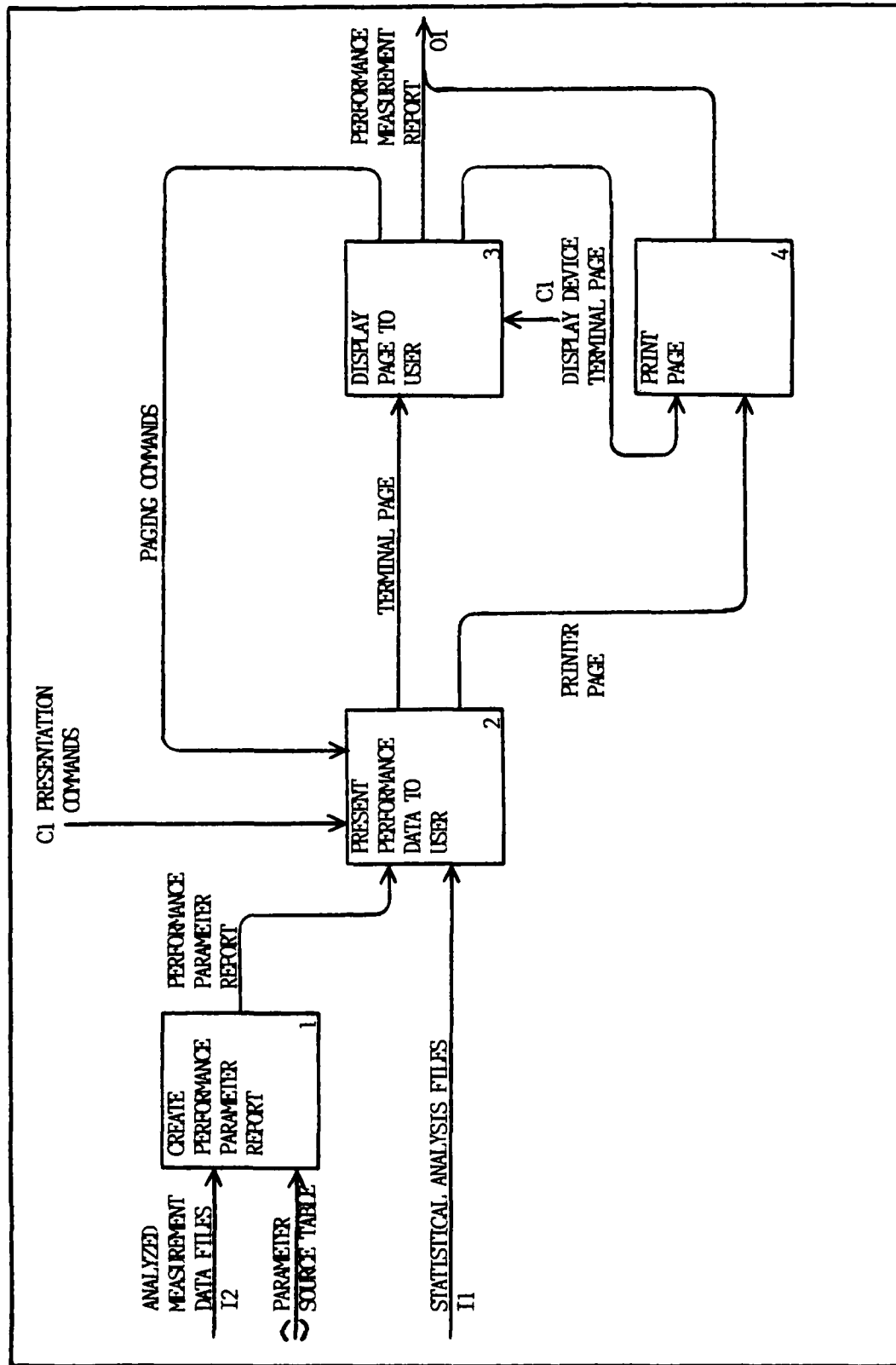
NODE: A4

TITLE: PRESENT PERFORMANCE MEASUREMENT DATA TO USER

D-13

A3   Analyze Measurement Data Files

Abstract: This activity takes the measurement data files
produced by the performance tools and performs mathematical
analysis on the data.   It calculates values for performance
parameters that are not directly measurable as well as
performing statistical analysis on the data files.

   A31 Analyze Measurement Data Files - This activity uses
the math-statistical packages and specialized analysis
programs to perform mathematical calculations on   the
measurement data.   These calculations are used to derive
values for performance parameters that are not otherwise
directly measurable.

   A32   Perform Statistical Analysis - This activity uses
the math-statistical package to perform statistical analysis
on the measurement data.   It produces analysis results such
as histograms, scattergrams, regression analysis, hypothesis
test, etc.

SET OF
PERFORMANCE PARAMETERS
PARAMETER SOURCE TABLE
MEASUREMENT DATA FILES
I1

MEASUREMENT
CONTROL
COMMANDS

C1   C2

ANALYSIS
COMMANDS

ANALYZE
MEASUREMENT
DATA FILES
1

ANALYZED MEASUREMENT DATA FILES

O2

MATH-STATISTICAL
ANALYSIS
M1

ANALYSIS
PROGRAMS
M2

PERFORM
STATISTICAL
ANALYSIS
2

STATISTICAL
ANALYSIS FILES

O1
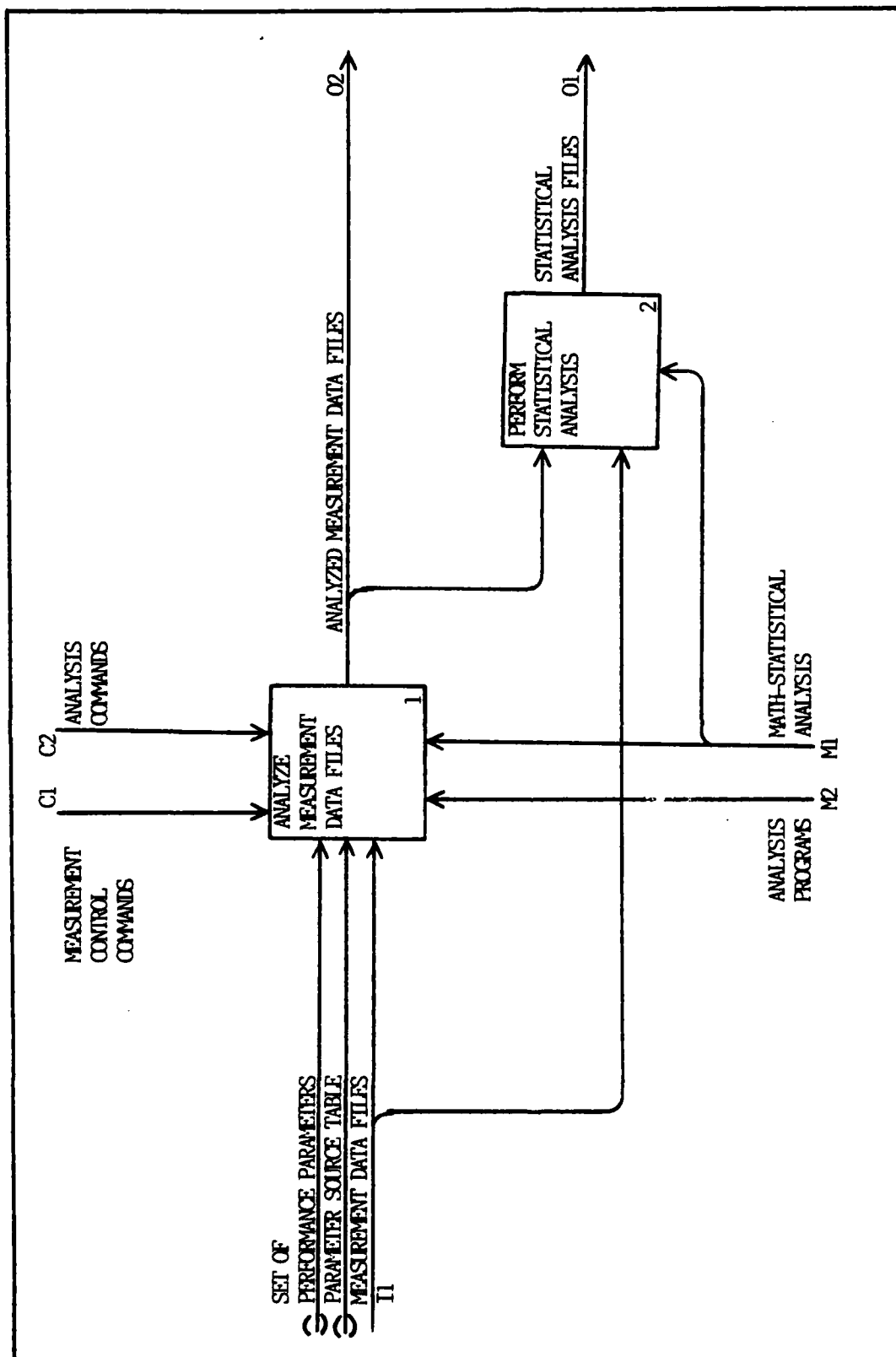
NODE: A3   TITLE: ANALYZE MEASUREMENT DATA FILES

A2 Measure System and DBMS

Abstract: This activity initiates the performance tools which measure and record values for the selected set of performance parameters.
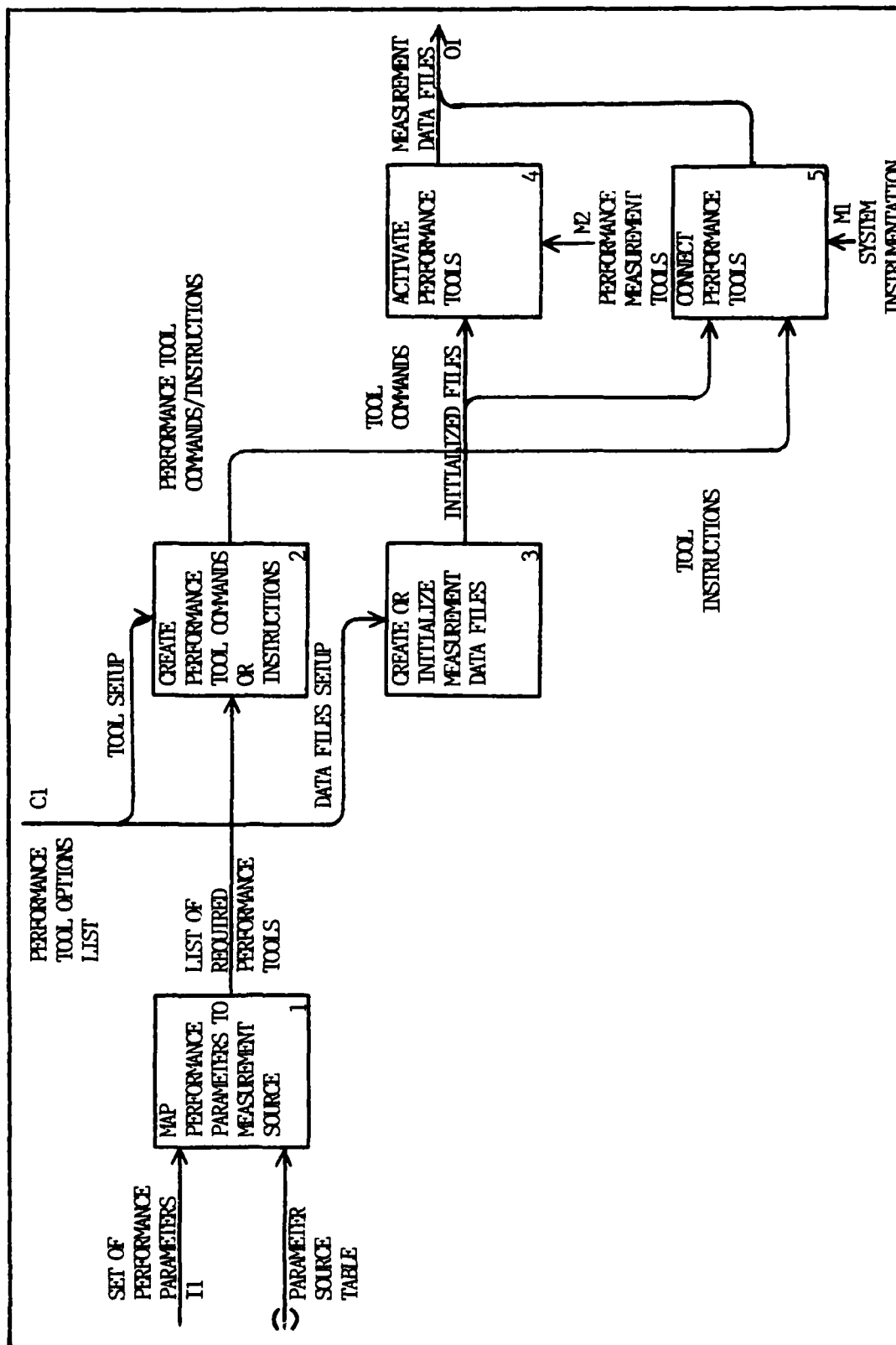
A21 Map Performance Parameters to Measurement Source - This activity selects the performance tools required to measure values for the set of performance parameters selected by the user of the monitor.

A22 Create Performance Tool Commands or Instructions - This activity creates the system commands used to initiate the performance tools. In the event a command cannot be created because the performance tool cannot be automatically initiated, a set of instructions for connecting the performance tool to the system and initiating its operation are created.

A23 Create/Initialize Measurement Data Files - This activity creates new files or initializes old files used to record the measured values of the performance parameters.

A24 Activate Performance Tools - This activity causes the performance tools to activate and begin measuring the system and the DBMS.

A25 Connect Performance Tools - This activity describes the connection process of a performance tool, such as a hardware monitor, that requires human intervention before it can begin measuring the system and the DBMS.

A diagram (IDEF0) rotated on the page. Text content:

I1 SET OF PERFORMANCE PARAMETERS

( ) PARAMETER SOURCE TABLE

Box 1: MAP PERFORMANCE PARAMETERS TO MEASUREMENT SOURCE — 1

PERFORMANCE TOOL OPTIONS LIST

LIST OF REQUIRED PERFORMANCE TOOLS

C1

TOOL SETUP

Box 2: CREATE PERFORMANCE TOOL COMMANDS OR INSTRUCTIONS — 2

DATA FILES SETUP

Box 3: CREATE OR INITIALIZE MEASUREMENT DATA FILES — 3

PERFORMANCE TOOL COMMANDS/INSTRUCTIONS

TOOL COMMANDS

INITIALIZED FILES

TOOL INSTRUCTIONS

Box 4: ACTIVATE PERFORMANCE TOOLS — 4

M2 PERFORMANCE MEASUREMENT TOOLS

Box 5: CONNECT PERFORMANCE TOOLS — 5

M1 SYSTEM INSTRUMENTATION

MEASUREMENT DATA FILES — O1

NODE: A2   TITLE: MEASURE SYSTEM AND DBMS

D-9

TABLE C-1

EFFICIENCY MEASURES

Performance Index	Performance Parameter	Description
UTILIZATION	I/O	
	MEAN I/O STATISTICS PER DML STATEMENT	
	Buffered I/O	Mean number of buffered I/Os
	Direct I/O	Mean number of direct I/Os
	Page faults	Mean number of page faults
	Page file usage	Mean number of paging I/Os
	CHANNELS	
	Utilization	Percentage of time channels were busy
	Total Direct I/Os	Total number of direct I/Os
	Total Buffered I/OS	Total number of buffered I/Os
	Total system requests	Total number of I/O requests
	Total DBMS requests	Total number of I/O requests by the DBMS

TABLE C-1

EFFICIENCY MEASURES

Performance Index	Performance Parameter	Description
UTILIZATION	I/O	
	Page write I/O rate	Rate of write operations to the paging file
	FCP call rate	Rate of QIO requests received by the system
	Disk read rate	Rate of read I/O operations from disk by the file system
	Disk write rate	Rate of write I/O operations from disk by the file system
	Cache hit rate	Rate at which requested blocks were located in the file system cache
	CPU tick rate	Rate at which CPU time was used by the file system
	Number of DB objects accessed per task	Total number of data base objects retrieved or stored from/into a data base

TABLE C-1

EFFICIENCY MEASURES

Performance Index	Performance Parameter	Description
UTILIZATION	MEMORY	
	System page reads	Number of page reads for all jobs
	DBMS page reads	Number of page reads for DBMS tasks
	Mean memory per DML statement	Average amount of memory required per DML statement
	I/O	
	Direct I/O rate	Rate of direct I/O operations
	Buffered I/O rate	Rate of buffered I/O operations
	Page fault rate	Rate of page faults for all working sets
	Page read rate	Rate of pages read from disk as a result of page faults
	Page read I/O rate	Rate of read I/O operations from diks as a result of page faults
	Page write rate	Rate of pages written to the paging file

TABLE C-1

EFFICIENCY MEASURES

Performance Index	Performance Parameter	Description
UTILIZATION	CPU	
	Total CPU time per DBMS task	CPU time required to complete a set of DML statements
	Mean CPU time per DML statement	Mean CPU time to complete a single DML statement
	MEMORY	
	DBMS memory utilization	Percentage of memory usage by DBMS task
	DBMS kernel	Amount of memory used by DBMS software
	DBMS applications	Amount of memory used by DBMS application programs
	DBMS user interfaces	Amount of memory user by DBMS user interfaces
	System page rate	Rate at which pages are retrieved from secondary storage
	System page faults	Number of page faults for all system processes and user jobs
	DBMS page faults	Number of page faults attributable to DBMS tasks

TABLE C-1

EFFICIENCY MEASURES

Performance Index	Performance Parameter	Description
ALLOCATION	Priority	Processing priority requested by a job
	Number of disk volumes	Number of disk volumes requested by a DBMS task
	Number of tape volumnes	Number of tape volumes requested by a DBMS task
	Number of data bases	Number of data bases requested by a DBMS task
	Allocation time	Time resource allocated to a DBMS task
UTILIZATION	CPU	
	CPU idle	Percentage of time the CPU was idle
	CPU utilization	Percentage of time the CPU was busy
	CPU in supervisor state	Percentage of CPU time dedicated to processing operating system overhead
	CPU in program state	Percentage of CPU time dedicated to processing user programs
	DBMS CPU utilization	Percentage of CPU time used by the DBMS

C-5

TABLE C-1

EFFECTIVENESS MEASURES

Performance Index	Performance Parameter	Description
INTEGRITY	Device errors	Number of times a device detected one or more errors during a time interval
	Component reliability	Probability of the component being active and working correctly at any given time
SECURITY	User access failures	Number of times users were denied access to some aspect of the computer system or DBMS due to insufficient priveleges
	Source of authorization failures	List of terminal identification codes, program names, and user idenification codes where the authorization failures occurred

TABLE C-1

EFFECTIVENESS MEASURES

Performance Index	Performance Parameter	Description
PRODUCTIVITY	System throughput	Number of jobs executed per unit of time
	DBMS throughput by DML statement	Number of DML statements executed per unit of time
	Retrieval	Number of DML retrieval statements
	Storage	Number of DML storage statements
	Control	Number of DML control statements
	Special purpose	Number of DML special purpose statements
RESPONSIVENESS	System turnaround	Elapsed time between submitting a job or command and receiving the output
	DBMS turnaround	Elapsed time between submitting a DBMS task and receiving the output
	System response time	Elapsed time of user requests and transactions in an interactive of real time mode
	DBMS response time	Elapsed time of a DML statement in an interactive mode
INTEGRITY	Availability	Percentage of time the computer system and DBMS is available to users

A41   Create Performance Parameter Report

Abstract: This activity creates a report of the measured
values for the performance parameters organized by their
corresponding performance index and performance parameter
name.

     A411   Partition Values by Performance Index - This
activity reads the analyzed measurement data files and
organizes   the   values according to their corresponding
performance index and performance parameter name.

     A412   Create Page One - This activity creates the first
page of the performance parameter report which contains all
of the effectiveness measures.

     A413   Create Page Two - This activity creates the second
page of the performance parameter report which contains the
allocation values of the efficiency measures.

     A414   Create Page Three and Four - This activity creates
the third and fourth pages of the performance parameter
report, and these pages contain all the utilization values
of the efficiency measures.

     A415   Present Performance Data to User - This activity
controls the presentation of the performance data to the
user of the monitor.

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A-0

NAME: DBMS Performance Monitor

INPUTS: User Input

OUTPUTS: Performance Measurement Report

CONTROL: None

MECHANISMS: System Instrumentation, Performance Measurement
Tools

DESCRIPTION: This diagram is the context diagram which
provides an overall, high level view of the system design.
It shows the highest level of all data elements and the
overall activity the system is being designed to accomplish.

RELATED REQUIREMENT NUMBER: A11

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: AO

NAME: DBMS Performance Monitor

INPUTS: User Input

OUTPUTS: Performance Measurement Report

CONTROL: None

MECHANISMS: System Instrumentation, Performance Measurement
Tools

DESCRIPTION: This diagram shows the four major activities
that must be accomplished by the DBMS Performance Monitor.

RELATED REQUIREMENT NUMBER: All

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A1

NAME: User Interface

INPUTS: User Input

OUTPUTS: Exit, Measurement Control Commands, Analysis
Commands, Presentation Commands

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity accepts the user's input to the
DBMS Performance Monitor. It allows the user to specify the
set of performance parameters to be measured, the start and
stop time of the measurement session, the types of data
analysis to be performed, and how the measurement data is to
be presented.   The data specified by the user is formatted
into command sets which are used as the interface mechanism
to the other major activities of the performance monitor.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A11

NAME: Display Screen Format

INPUTS: Next Screen Format, Error Message

OUTPUTS: Screen Displayed

CONTROL: None

MECHANISMS: Terminal

DESCRIPTION: This activity displays screen formats and error messages onto the user's terminal. This is the key activity in presenting a "user-friendly" interface to the users of the DBMS Performance Monitor.

RELATED REQUIREMENT NUMBER:

ALIASES: None

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A12

NAME: Accept and Evaluate User Input

INPUTS: User Input

OUTPUTS: Exit, Performance Parameter Data, Performance Tool
Data, Analysis Data, Presentation Data

CONTROL: Screen Displayed

MECHANISMS: Terminal

DESCRIPTION: This activity accepts the data entered by the
user and evaluates it to determine which processing activity
the data must be passed to for building a command set.   It
also determines when the user wants to exit the user
interface.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A13

NAME: Build Set of Performance Parameters

INPUTS: Performance Parameter Data

OUTPUTS: Screen   Format Command,   Set   of   Performance
Parameters

CONTROL: None

MECHANISMS: None

DESCRIPTION: This   activity builds the set of performance
parameters the user wants to measure.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A14

NAME: Build Performance Tool Options

INPUTS: Performance Tool Data

OUTPUTS: Screen Format Command, Performance Tool Option
List

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity builds the options list for the
performance tools.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A15

NAME: Build Analysis Commands

INPUTS: Analysis Data

OUTPUTS: Screen Format Command, Analysis Commands

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity builds the commands used to control the execution of the analysis programs and the math-statistical package.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A16

NAME: Build Presentation Commands

INPUTS: Presentation Data

OUTPUTS: Screen Format Command, Presentation Commands

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity builds the commands used to control the execution of data presentation programs.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A2

NAME: Measure System and DBMS

INPUTS: Set of Performance Parameters

OUTPUTS: Measurement Data Files

CONTROL: Performance Tool Options List

MECHANISMS: System Instrumentation, Performance Measurement
Tools

DESCRIPTION: This activity initiates the performance tools
which measure and record values for the selected set of
performance parameters.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A21

NAME: Map Performance Parameters to Measurement Source

INPUTS: Set of Performance Parameters, Parameter Source Table

OUTPUTS: List of Required Performance Tools

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity selects the performance tools required to measure values for the set of performance parameters selected by the user of the monitor.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A22

NAME: Create Performance Tool Commands or Instructions

INPUTS: List of Required Performance Tools

OUTPUTS: Performance Tool Commands or Instructions

CONTROL: Tool Set-up

MECHANISMS: None

DESCRIPTION: This activity creates the system commands used
to initiate the performance tools.   In the event a command
cannot be created because the performance tool cannot be
automatically   initiated,   a   set   of instructions   for
connecting the performance tool to the system and initiating
its operation are created.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A23

NAME: Create/Initialize Measurement Data Files

INPUTS: None

OUTPUTS: Initialized Files

CONTROL: Data Files Set-up

MECHANISMS: None

DESCRIPTION: This activity creates new files or initializes old files used to record the measured values of the performance parameters.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A43

NAME: Display Page to User

INPUTS: Terminal Page, User Input

OUTPUTS: Paging Commands, Terminal Page, Performance Measurement Report

CONTROL: None

MECHANISMS: Display Device

DESCRIPTION: This activity displays a page of the performance measurement report on the screen of a terminal. It allows the user to selectively view and/or print the desired parts of the performance measurement report.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A42

NAME: Present Performance Data to User

INPUTS: Performance Parameter Report, Statistical Analysis
File

OUTPUTS: Terminal Page, Printer Page

CONTROL: Presentation Commands, Paging Commands

MECHANISMS: None

DESCRIPTION: This activity controls the presentation of the
performance data to the user of the monitor.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A415

NAME: Combine Pages

INPUTS: Page One, Page Two, Page Three and Four

OUTPUTS: Performance Parameter Report

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity combines the four pages of the performance parameter report into one consolidated report.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A414

NAME: Create Page Three and Four

INPUTS: Utilization Values

OUTPUTS: Page Three and Four

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity creates the third and fourth pages of the performance parameter report which contain the utilization values of the efficiency measures.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A413

NAME: Create Page Two

INPUTS: Allocation/Deallocation Values

OUTPUTS: Page Two

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity creates the second page of the
performance parameter report which contains the allocation
and deallocation values of the efficiency measures.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A412

NAME: Create Page One

INPUTS: Effectiveness Measures

OUTPUTS: Page One

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity creates the first page of the
performance parameter report which contains all of the
effectiveness measures.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A411

NAME: Partition Values by Performance Index

INPUTS: Analyzed Measurement Data Files, Paramter Source
Table

OUTPUTS: Effectiveness Measures, Efficiency Measures

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity reads the analyzed measurement
data files and organizes the values according to their
corresponding performance index and performance parameter
name.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A41

NAME: Create Performance Parameter Report

INPUTS: Analyzed Measurement Data Files, Parameter Source
Table

OUTPUTS: Performance Parameter Report

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity creates a report of the measured
values for the performance parameters organized by their
corresponding performance index and performance parameter
name.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A4

NAME: Present Performance Measurement Data to User

INPUTS: Analyzed Measurement Data Files,   Statistical Analysis Files

OUTPUTS: Performance Measurement Report

CONTROL: Presentation Commands

MECHANISMS: Display Device

DESCRIPTION: This   activity   presents   the   performance measurement data to the user of the monitor in the form of a performance measurement report.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A32

NAME: Perform Statistical Analysis

INPUTS: Measurement Data Files, Analyzed Measurement Data
Files

OUTPUTS: Statistical Analysis Files

CONTROL: Analysis Commands

MECHANISMS: Math-Statistical Package

DESCRIPTION: This activity uses the math-statistical
package to perform statistical analysis on the measurement
data. It produces analysis results such as histograms,
scattergrams, regression analysis, hypothesis test, etc.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A31

NAME: Analyze Measurement Data Files

INPUTS: Set of Performance Parameters, Measurement Data Files, Parameter Source Table

OUTPUTS: Analyzed Measurement Data Files

CONTROL: Analysis Commands

MECHANISMS: Math-Statistical Package, Analysis Programs

DESCRIPTION: This activity uses math-statistical packages and specialized analysis programs to perform mathematical calculations on the measurement data.   These calculations are used to derive values for performance parameters that are not otherwise directly measureable.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A3

NAME: Analyze Measurement Data Files

INPUTS: Measurement Data Files

OUTPUTS: Analyzed Measurement Data Files, Statistical
Analysis Files

CONTROL: Analysis Commands

MECHANISMS: Math-Statistical Package, Analysis Programs

DESCRIPTION: This activity takes the measurement data files
produced by the performance tools and performs mathematical
analysis on the data.   It calculates values for performance
parameters that are not directly measurable as well as
performing statistical analysis on the data files.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A25

NAME: Connect Performance Tools

INPUTS: Tool Instructions, Initialized Files

OUTPUTS: Measurement Data Files

CONTROL: None

MECHANISMS: System Instrumentation

DESCRIPTION: This activity describes the connection process
of a performance tool, such as a hardware monitor, that
requires human intervention before it can begin measuring
the system and the DBMS.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A24

NAME: Activate Performance Tools

INPUTS: Tool Commands, Initialized Files

OUTPUTS: Measurement Data Files

CONTROL: None

MECHANISMS: System Instrumentation

DESCRIPTION: This activity causes the performance tools to
activate and begin measuring the system and the DBMS.

RELATED REQUIREMENT NUMBER:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Activity

DATE: 13 Jul 84

NUMBER: A44

NAME: Print Page

INPUTS: Terminal Page, Printer Page

OUTPUTS: Performance Measurement Report

CONTROL: None

MECHANISMS: None

DESCRIPTION: This activity will print a page of the
performance measurement report on the printer of the
computer system.

RELATED REQUIREMENT NUMBER:

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Allocation/Deallocation Values

DESCRIPTION: Measured   values   for   the   allocation   and
deallocation performance parameters which are a part of the
system efficiency measures.

SOURCES: A411

DESTINATIONS: A413

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric

VALUES: 0 to Max Size

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Analysis Commands

DESCRIPTION: Set of commands used to control the analysis
of the measurement data recorded by the performance tools.

SOURCES: A1, A15

DESTINATIONS: A3, A31, A32

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Analysis Data

DESCRIPTION: Data input by the user to specify how the
measurement data is to be analyzed.   It is used to build a
set of Analysis Commands.

SOURCES: A12

DESTINATIONS: A15

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric, String

VALUES: 0 to Max Size, System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Analysis Programs

DESCRIPTION: Specially designed computer programs for
analyzing the measurement data produced by the performance
tools.

SOURCES: System Program Library

DESTINATIONS: A3, A31

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Executable Computer Code

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Analyzed Measurement Data Files

DESCRIPTION: Data files containing the measurement data after it has been analyzed by the analysis programs and the math-statistical package.

SOURCES: A3, A31

DESTINATIONS: A32, A4, A41, A411

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric

VALUES: 0 to Max Size

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Data Files Set-up

DESCRIPTION: Part of the performance tool options list used to control the creation and initialization of the measurement data files.

SOURCES: A1, A14

DESTINATIONS: A23

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Display Device

DESCRIPTION: Device used to display the performance measurements to the monitor user.

SOURCES: System Hardware

DESTINATIONS: A4, A43

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: None

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Effectiveness Measures

DESCRIPTION: Major category of performance indexes used to
classify performance parameters.

SOURCES: A411

DESTINATIONS: A412

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric

VALUES: 0 to Max Size

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Efficiency Measures

DESCRIPTION: Major category of performance indexes used to
classify performance parameters.

SOURCES: A411

DESTINATIONS: A413, A414

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric

VALUES: 0 to Max Size

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Error Message

DESCRIPTION: Informational message to be displayed to a user of the monitor to inform them of an incorrect or invalid input.

SOURCES: A13, A14, A15, A16

DESTINATIONS: A11

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Exit

DESCRIPTION: Denotes a user's exit from the user interface
of the monitor.

SOURCES: A1, A12

DESTINATIONS: Return to Operating System

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: None

VALUES: None

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Initialized Files

DESCRIPTION: Data   files   that   have   been   created   or
initialized before the beginning of a measurement session.

SOURCES: A23

DESTINATIONS: A24, A25

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: File

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: List of Required Performance Tools

DESCRIPTION: List of the performance tools that must be
used to measure values for the set of performance parameters
selected by the user.

SOURCES: A21

DESTINATIONS: A22

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Tool Commands/Instructions

DESCRIPTION: System commands and/or user instructions for
initiating a performance tool to begin measuring and
recording values.

SOURCES: A22

DESTINATIONS: A24

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Parameter Report

DESCRIPTION: Report containing the values for the set of
performance parameters selected by the user.

SOURCES: A41, A415

DESTINATIONS: A42

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Formatted Report

VALUES:

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Parameter Data

DESCRIPTION: Data input by the user to specify the set of
performance parameters to be measured.

SOURCES: A12

DESTINATIONS: A13

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric and/or String

VALUES: 0 to Max Size, System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Measurement Tools

DESCRIPTION: Software and/or hardware tools used to measure
and record values for the selected set of performance
parameters.

SOURCES: System Software, Computer Vendors

DESTINATIONS: A2

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Executable Code or Hardware Device

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Measurement Report

DESCRIPTION: Performance   measurement report presented   to
the monitor users.   It contains the values for   the
performance parameters and any statistical analysis.

SOURCES: A4, A43, A44

DESTINATIONS: Final Output to Users of the monitor

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Formatted Report

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Parameter Source Table

DESCRIPTION: Data structure used to map a performance
parameter to a source it can be measured from.

SOURCES: Part of the DBMS Performance Monitor software

DESTINATIONS: A21, A31, A41, A411

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric and/or String

VALUES: 0 to Max Size, System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Paging Commands

DESCRIPTION: Commands used to control the displaying of the
performance measurement report on a terminal.

SOURCES: A43

DESTINATIONS: A42

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Page Three and Four

DESCRIPTION: Page three and four of the performance parameter report. It contains the utilization values of the efficiency measures.

SOURCES: A414

DESTINATIONS: A415

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Formatted Report

VALUES:

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Page Two

DESCRIPTION: Page two of the performance parameter report.
It contains the allocation and deallocation values of the
efficiency measures.

SOURCES: A413

DESTINATIONS: A415

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Formatted Report

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Page One

DESCRIPTION: Page one of the performance parameter report.
It contains the effectiveness measures.

SOURCES: A412

DESTINATIONS: A415

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Formatted Report

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Next Screen Format

DESCRIPTION: Specifies the next screen format to be displayed to the user of the monitor.

SOURCES: A13, A14, A15, A16

DESTINATIONS: All

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Measurement Data Files

DESCRIPTION: Data files used to record the measurements
taken by the performance tools.

SOURCES: A2, A24, A25

DESTINATIONS: A3, A31

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric

VALUES: 0 to Max Size

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Measurement Control Commands

DESCRIPTION: Set of commands used to specify and control a performance measurement session.

SOURCES: A1, A13, A14

DESTINATIONS: A2

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Math-Statistical Package

DESCRIPTION: Software package used to calculate values for
performance parameters and to statistically analyze the data
in the measurement data files.

SOURCES: System Software

DESTINATIONS: A3, A31, A32

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Executable Computer Code

VALUES:

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Tool Data

DESCRIPTION: Data input by the user to specify operational parameters for the performance tools such as start time, stop time, etc.. It is used to build the performance tool options list.

SOURCES: A12

DESTINATIONS: A14

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Performance Tool Options List

DESCRIPTION: Set of options used to create a complete command for a performance tool. Typically, this list will contain items such as: start time, stop time, data file options, etc..

SOURCES: A1, A14

DESTINATIONS: A2, A22, A23

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Presentation Commands

DESCRIPTION: Set of commands used to control the presentation of the measurement data to the user of the monitor.

SOURCES: A1, A15

DESTINATIONS: A4, A42

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Presentation Data

DESCRIPTION: Data input by the user to specify how the
measurement data is to be presented.   It is used to build a
set of Presentation Commands.

SOURCES: A12

DESTINATIONS: A16

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Printer Page

DESCRIPTION: Formatted page of the performance measurement
report to be printed on the system printer.

SOURCES: A42

DESTINATIONS: A44

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Formatted Report

VALUES:

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Screen Displayed

DESCRIPTION: Used to control the displaying of screen
formats and the entry of data by the user.   It ensures the
screen format has been displayed before the user attempts to
enter any data.

SOURCES: All

DESTINATIONS: A12

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Boolean

VALUES: True or False

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Screen Format Command

DESCRIPTION: Specifies what is to be displayed on the terminal when a user is entering data through the user interface.

SOURCES: A13, A14, A15, A16

DESTINATIONS: All

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

TYPE: Data Element

DATE: 13 Jul 84

NAME: Set of Performance Parameters

DESCRIPTION: Specifies the set of performance parameters
the user of the monitor wants to measure and record.

SOURCES: A1, A13

DESTINATIONS: A2, A21, A31

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Statistical Analysis Files

DESCRIPTION: Files produced as a result of performing statistical analysis on the measurement data produced by the performance tools.

SOURCES: A3, A32

DESTINATIONS: A4, A42

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: Numeric

VALUES: 0 to Max Size

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

'PE: Data Element

ITE: 13 Jul 84

IME: System Instrumentation

ESCRIPTION: The facilities used to connect the performance
)ols to the measured system.

)URCES: System   Software   and   the   Operating   System,
lectronic Probes

ESTINATIONS: A2, A24, A25

)MPOSITION:

IRT OF:

ITA CHARACTERISTICS:

ALUES:

LIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Tool Commands

DESCRIPTION: Command used to initiate a performance tool to
begin measuring and recording values.

SOURCES: A22

DESTINATIONS: A24

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Tool Instructions

DESCRIPTION: Instructions for connecting and initiating a
performance tool that requires human intervention.

SOURCES: A22

DESTINATIONS: A25

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

SYSTEM DESIGN DOCUMENTATION - SADT

TYPE: Data Element

DATE: 13 Jul 84

NAME: Tool Set-up

DESCRIPTION: Specifies how the performance tool is to be
set-up and used.

SOURCES: A1, A14

DESTINATIONS: A22

COMPOSITION:

PART OF:

DATA CHARACTERISTICS: String

VALUES: System Alphabet

ALIASES: None

Appendix E

Program Documentation

Table of Contents

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Introduction

This appendix contains the program documentation developed for the DBMS performance monitor. The program documentation consists of structure charts and data dictionaries for each section of the project.

SYSTEMS DESIGN - STRUCTURE CHARTS

Chart Index

SYSTEMS DESIGN - STRUCTURE CHARTS

<div style="margin-left: 2em">

3.1.4.5 PERFORM DATA BASE OPERATIONS

3.1.4.5.1 RETRIEVE
            MEASUREMENT DATA
3.1.4.5.2 REMOVE MEASUREMENT
            DATA
3.1.4.5.3 ADD MEASUREMENT
            DATA

</div>

3.1.5 EXIT PROGRAM

4.0 GET MENU SELECTION
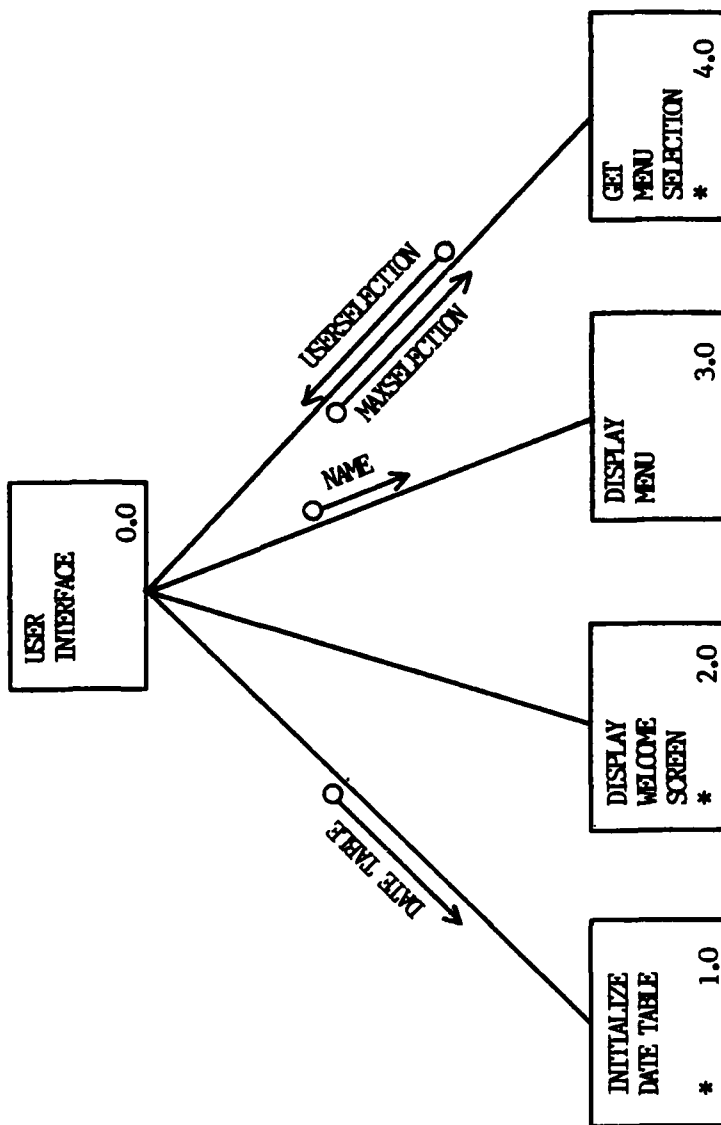
NOTE: See Capt Bailor's Thesis for design.

NODE: 0.0   TITLE: USER INTERFACE

E-5
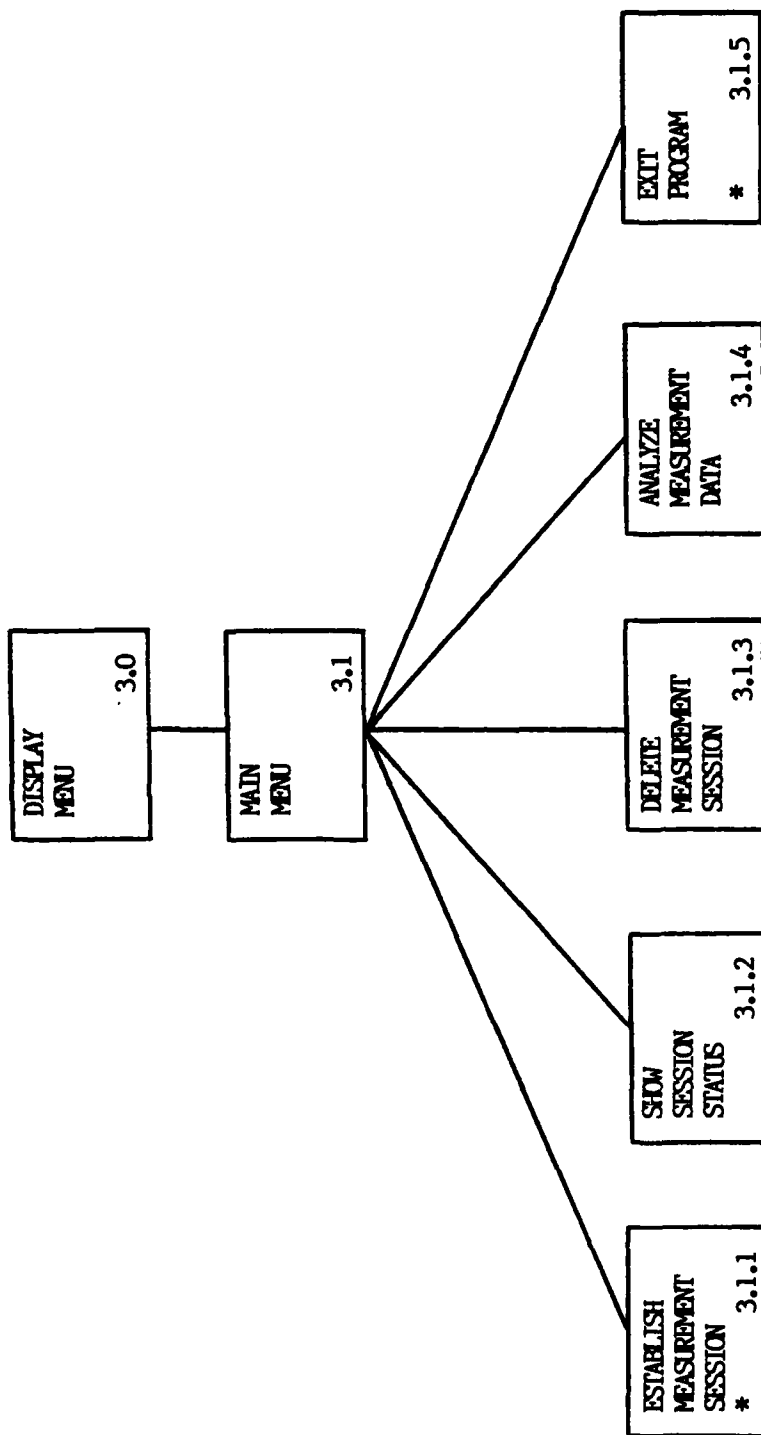
TITLE: DISPLAY MENU

NODE: 3.0

NOTE: See Capt Bailor's Thesis for design.
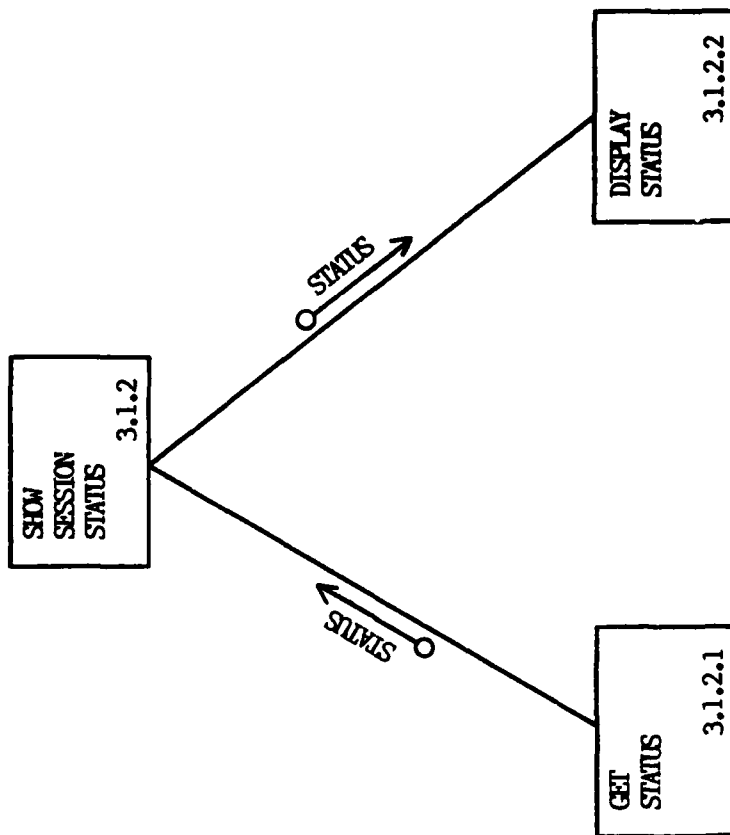
NODE: 3.1.2   TITLE: SHOW SESSION STATUS
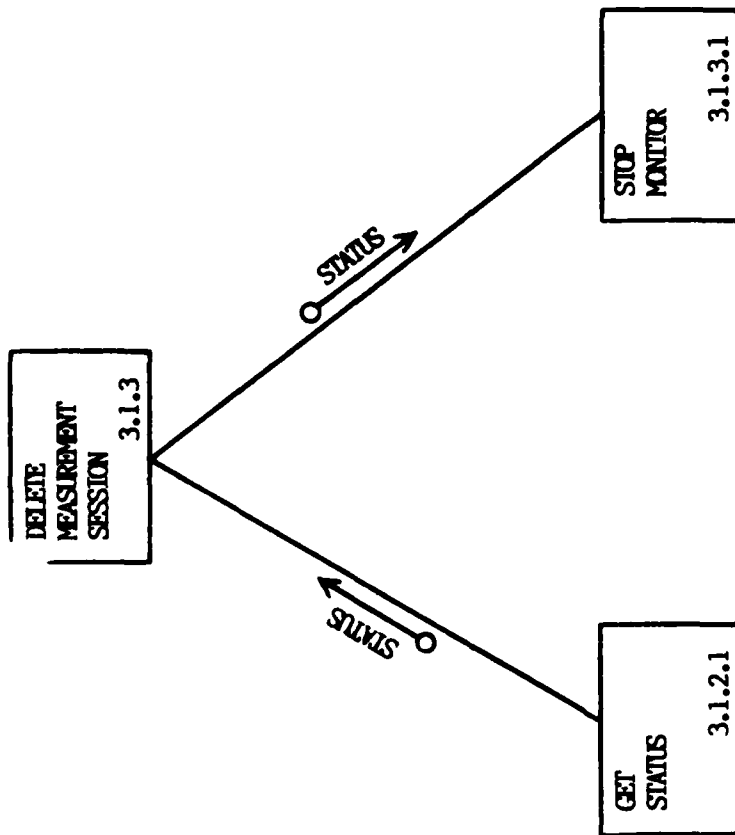
TITLE: DELETE MEASUREMENT SESSION
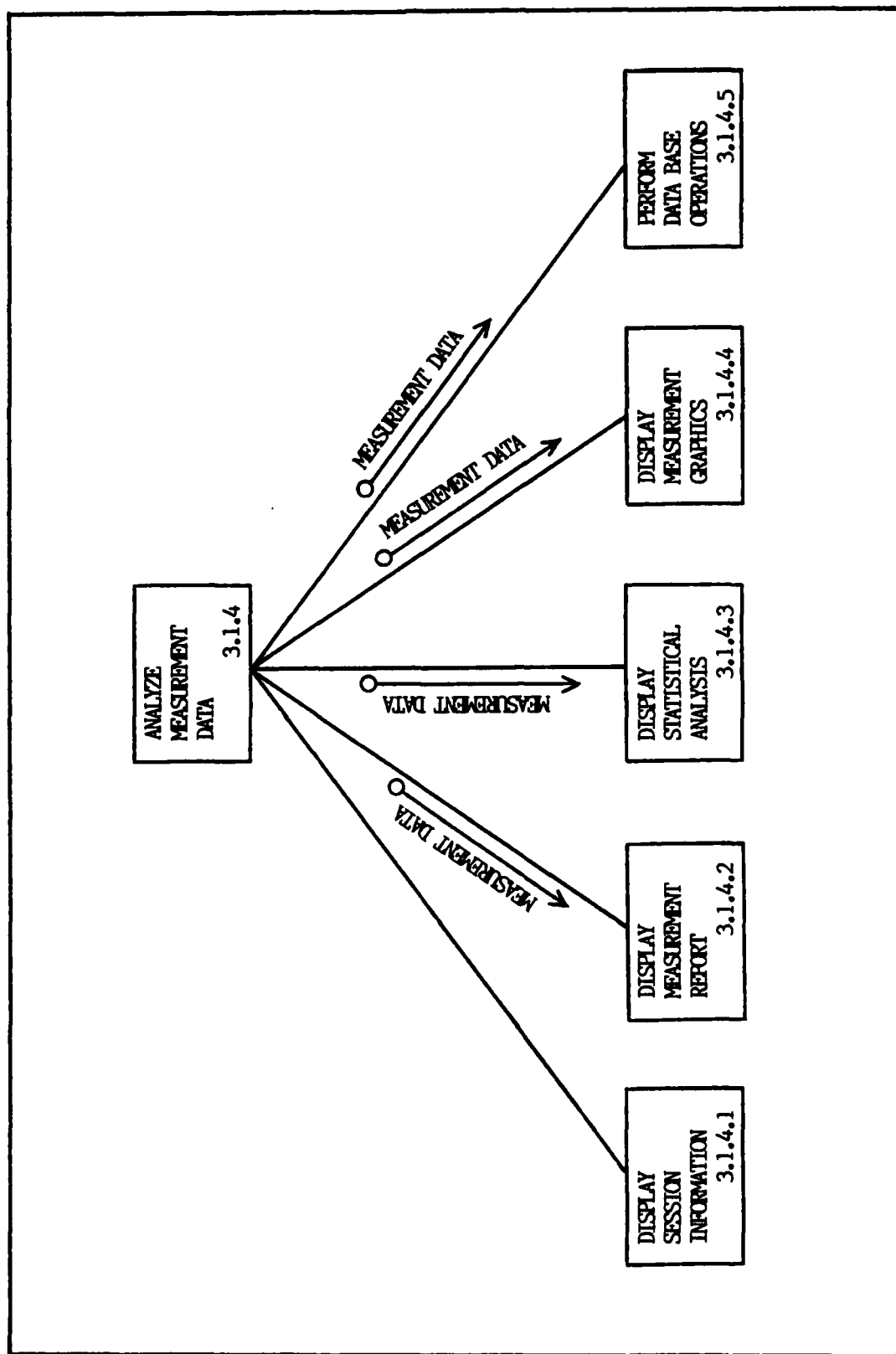
NODE: 3.1.3

NODE: 3.1.4   TITLE: ANALYZE MEASUREMENT DATA
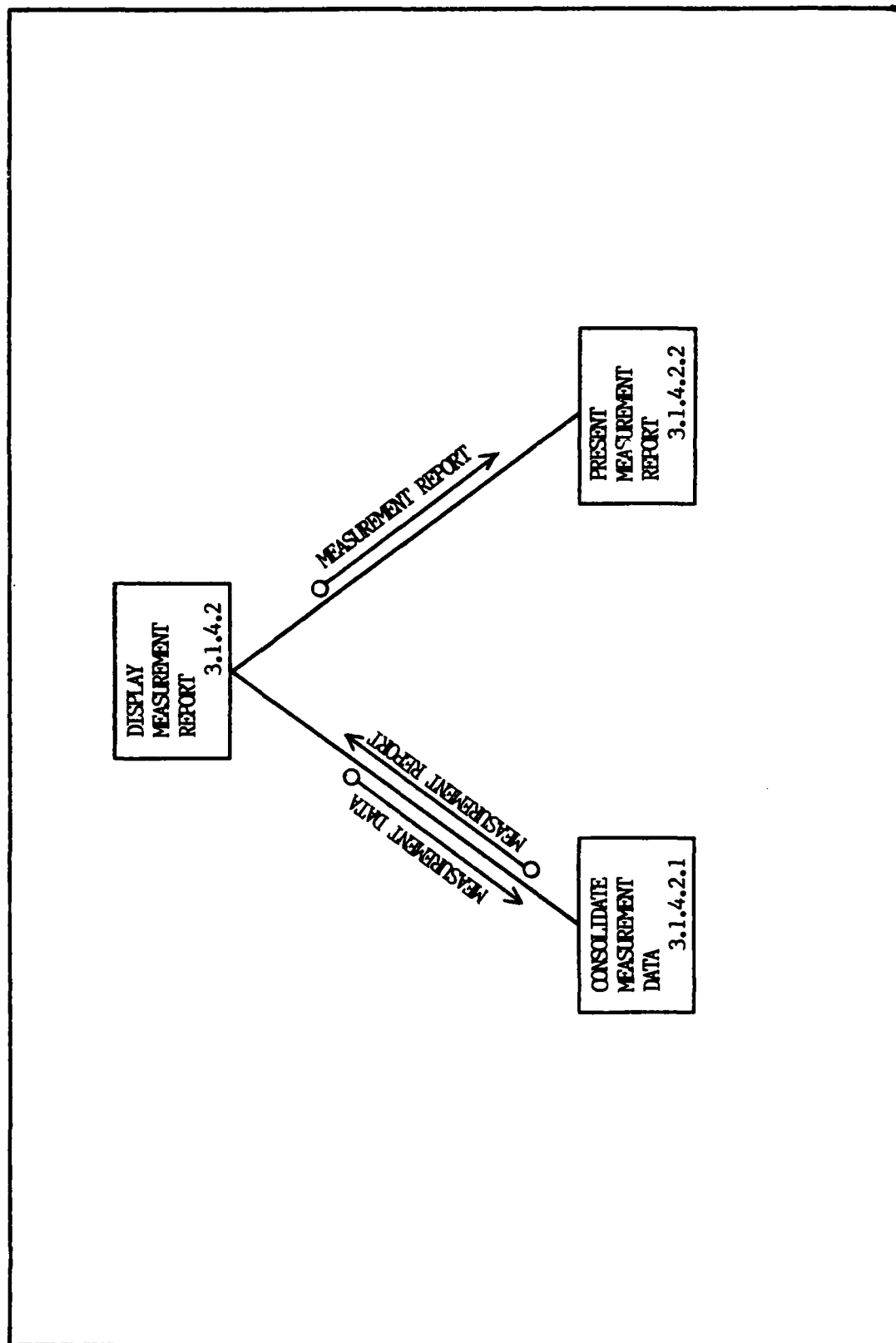
TITLE: DISPLAY MEASUREMENT REPORT
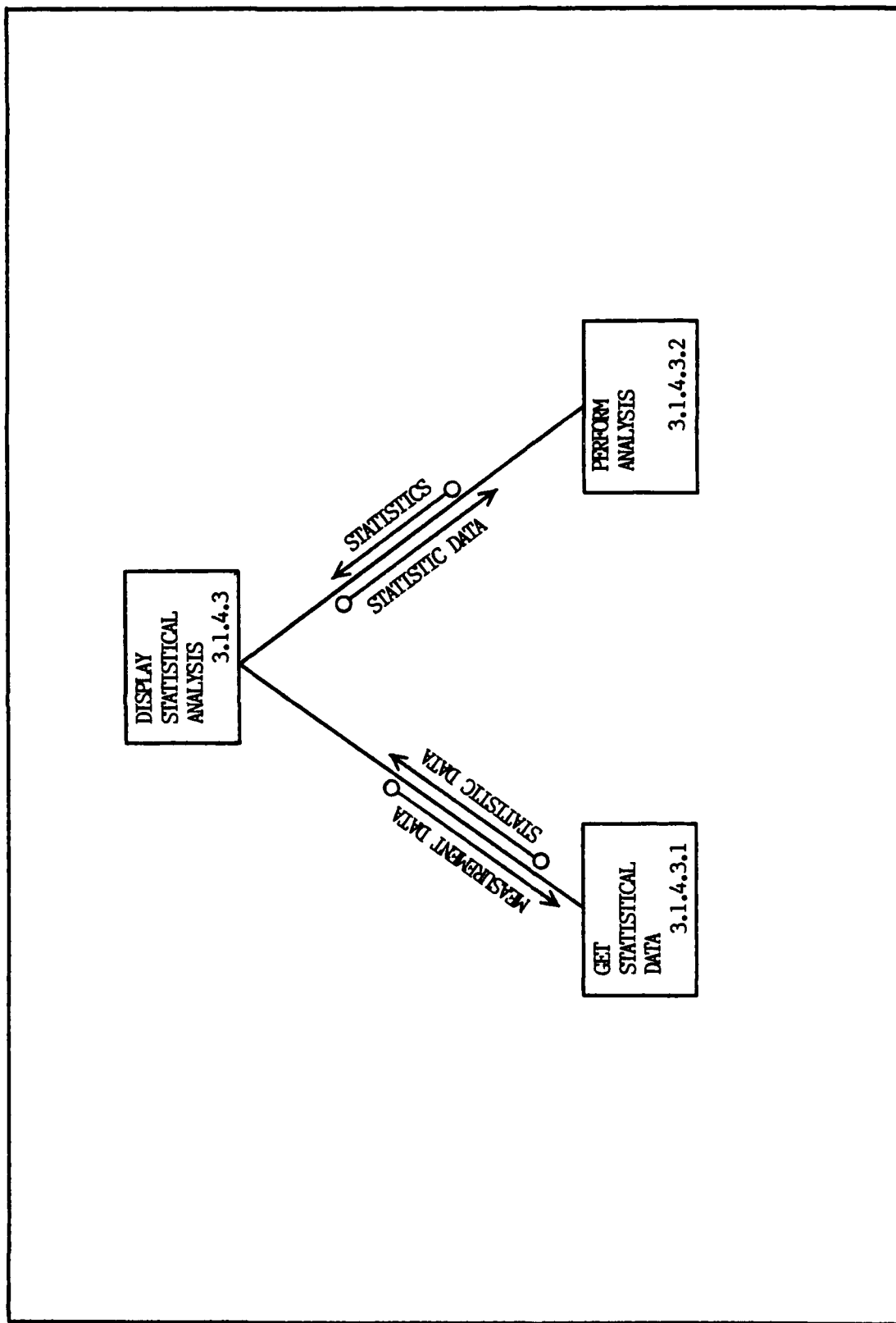
NODE: 3.1.4.2

NODE: 3.1.4.3   TITLE: DISPLAY STATISTICAL ANALYSIS

DISPLAY
MEASUREMENT
GRAPHICS
3.1.4.4

GRAPHIC DATA

PRESENT
GRAPHICS
3.1.4.4.2

GRAPHIC DATA

MEASUREMENT DATA

GET
GRAPHIC
DATA
3.1.4.4.1
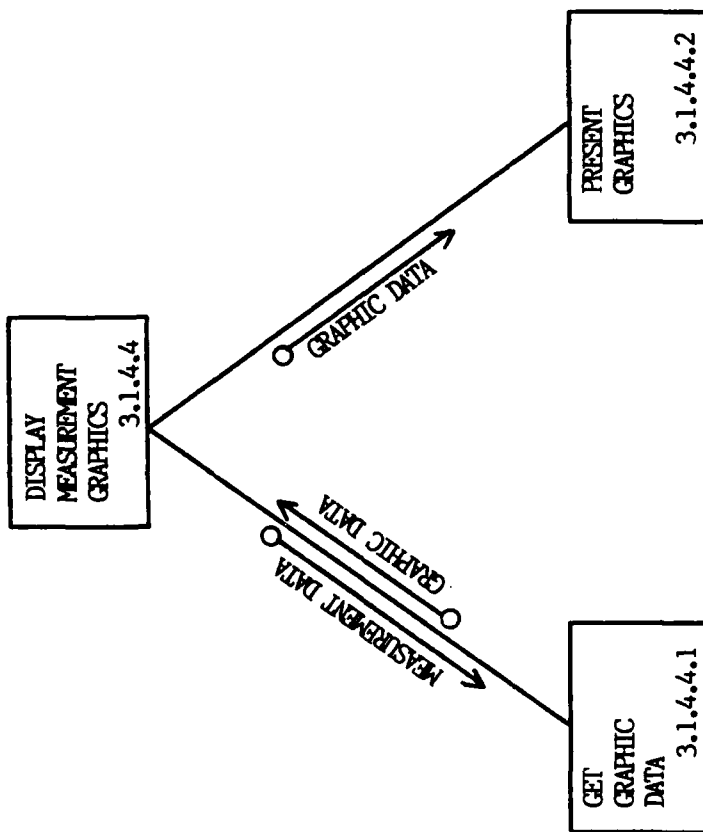
NODE: 3.1.4.4   TITLE: DISPLAY MEASUREMENT GRAPHICS
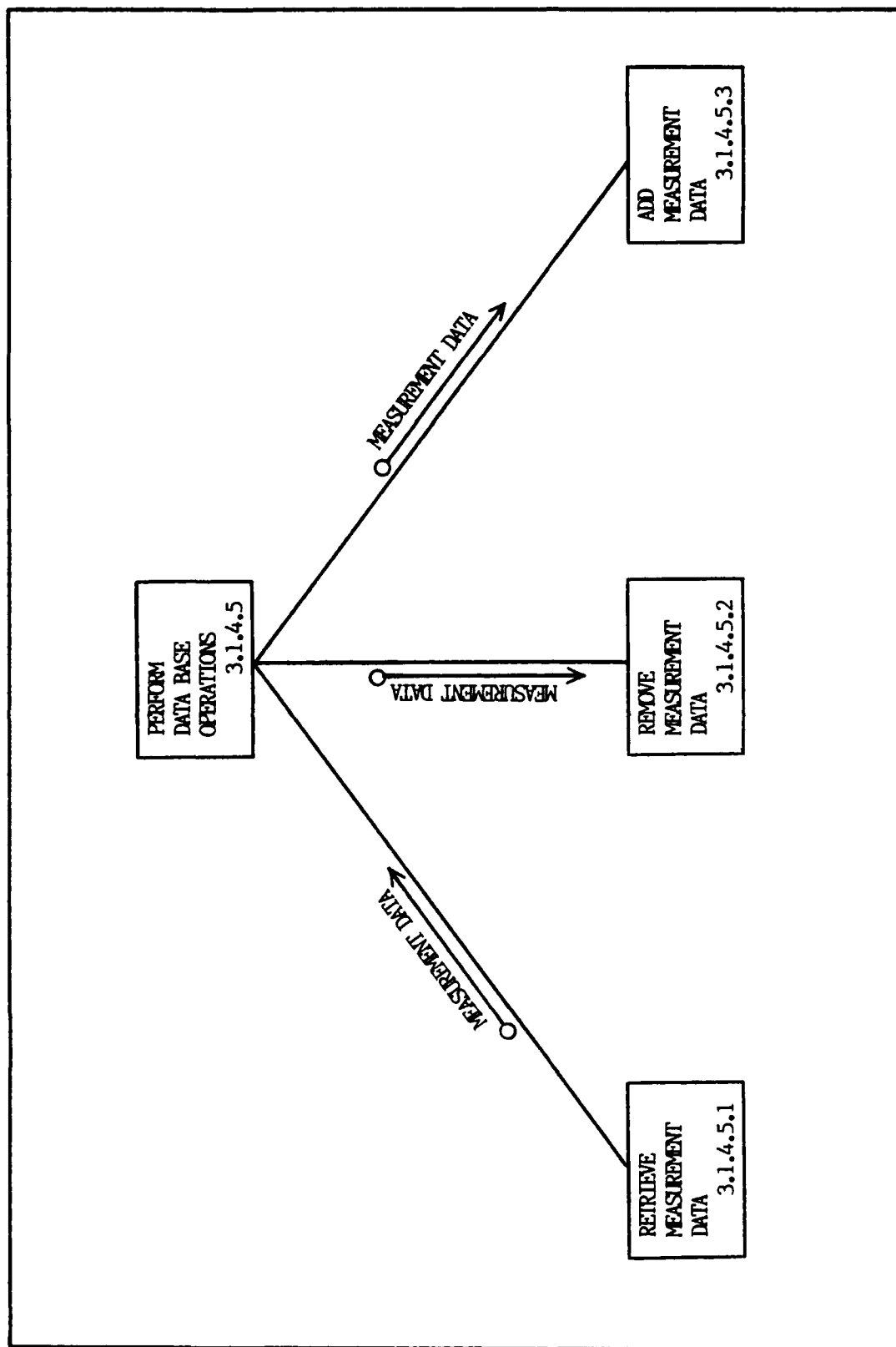
TITLE: PERFORM DATA BASE OPERATIONS

NODE: 3.1.4.5

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.3.2

NAME: STOP MONITOR

INPUT DATA: STATUS

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process stops the current performance
measurement session.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.1.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.2.2

NAME: DISPLAY STATUS

INPUT DATA: STATUS

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This   process displays   the   status   of   a
measurement session to the user.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.1.2

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.2.1

NAME: GET STATUS

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: STATUS

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process determines the status a a
performance measurement session.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.1.2, 3.1.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.5

NAME: EXIT PROGRAM

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process ends the user interface to the
Data Base Performance Monitor.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: See Capt Bailor's Thesis

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4

NAME: ANALYZE MEASUREMENT DATA

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process allows the user to display and
analyze performance measurement data.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: 3.1.4.1, 3.1.4.2, 3.1.4.3, 3.1.4.4,
3.1.4.5

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.3

NAME: DELETE MEASUREMENT SESSION

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process allows the user to delete a performance measurement session from the system.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: 3.1.3.1, 3.1.3.2

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.2

NAME: SHOW SESSION STATUS

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This   process displays the   status   of   a
performance measurement session to the user.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: 3.1.2.1, 3.1.2.2

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.1

NAME: ESTABLISH MEASUREMENT SESSION

INPUT DATA:

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process allows the user to establish a
performance monitor session.

ALIASES: None

RELATED SADT NUMBER: A2

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: See Capt Bailor's Thesis

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1

NAME: MAIN MENU

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process displays the main menu for the
Data Base Performance Monitor.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 3.0

PROCESSES CALLED: 3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.1.5

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 4.0

NAME: GET MENU SELECTION

INPUT DATA: MAXSELECTION

INPUT FLAGS: None

OUTPUT DATA: USERSELECTION

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process gets and edits a users menu
selection.

ALIASES: None

RELATED SADT NUMBER: A11

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: See Capt Bailor's Thesis

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.0

NAME: DISPLAY MENU

INPUT DATA: NAME

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process displays a menu to the user of
the Data Base Performance Monitor.

ALIASES: None

RELATED SADT NUMBER: A16

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: 3.1

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: Terminal

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN – STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 2.0

NAME: DISPLAY WELCOME SCREEN

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process displays the welcome screen for
the Data Base Performance Monitor.

ALIASES: None

RELATED SADT NUMBER: A1

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 1.0

NAME: INITIALIZE DATE TABLE

INPUT DATA: DATE TABLE

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process initializes the date table for
editing month and day values.

ALIASES: None

RELATED SADT NUMBER: A11

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 0.0

NAME: DBMON

INPUT DATA: USERSELECTION

INPUT FLAGS: None

OUTPUT DATA: DATE TABLE, NAME, MAXSELECTION

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process is the user interface for a data base performance monitor. It establishes the performance measurement session, shows the status of a measurement session, alters a measurement session, and analyzes the measurement data.

ALIASES: None

RELATED SADT NUMBER: AO

ALGORITHM: None

CALLING PROCESSES: None

PROCESSES CALLED: INITIALIZE DATE TABLE, DISPLAY WELCOME SCREEN, DISPLAY MENU, GET MENU SELECTION

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN – STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.1

NAME: DISPLAY SESSION INFORMATION

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process displays the mesurement session
information.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.1.4

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.2

NAME: DISPLAY MEASUREMENT REPORT

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process produces and displays the consolidated measurement report.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.1.4

PROCESSES CALLED: 3.1.4.2.1, 3.1.4.2.?

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.3

NAME: DISPLAY STATISTICAL ANALYSIS

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process generates and displayes the statistical analysis of the measurement data.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4

PROCESSES CALLED: 3.1.4.3.1, 3.1.4.3.2

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.4

NAME: DISPLAY MEASUREMENT GRAPHICS

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process generates and displays the
graphical presentation of measurement data to the user.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4

PROCESSES CALLED: 3.1.4.4.1, 3.1.4.4.2

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.5

NAME: PERFORM DATA BASE OPERATIONS

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process performs data base operations on
the measurement data data base.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4

PROCESSES CALLED: 3.1.4.5.1, 3.1.4.5.2, 3.1.4.5.3

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.2.1

NAME: CONSOLIDATE MEASUREMENT DATA

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT REPORT

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process consolidates the measurement data
from system instrumentation and performance tools into the
performance measurement report.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.1.4.2

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.2.2

NAME: PRESENT MEASUREMENT REPORT

INPUT DATA: MEASUREMENT REPORT

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process displays the pages of the
performance measurement report to the user.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.1.4.2

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.3.1

NAME: GET STATISTICAL DATA

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: STATISTIC DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process gets requested measurement data
to be used for statistical analysis.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.3.2

NAME: PERFORM ANALYSIS

INPUT DATA: STATISTIC DATA

INPUT FLAGS: None

OUTPUT DATA: STATISTICS

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process performs the requested statistical analysis on the measurement data.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.4.1

NAME: GET GRAPHIC DATA

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: GRAPHIC DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process gets the requested measurement
data to be graphically displayed to the user.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.4

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.4.2

NAME: PRESENT GRAPHICS

INPUT DATA: GRAPHIC DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process displays the requested graphical
presentation of the measurement data.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.4

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.5.1

NAME: RETRIEVE MEASUREMENT DATA

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process retrieves the requested
measurement data from the data base.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.5

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.5.2

NAME: REMOVE MEASUREMENT DATA

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process removes the requested measurement
data from the data base.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.5

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4.5.3

NAME: ADD MEASUREMENT DATA

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process adds the requested measurement
data to the data base.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 3.1.4.5

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: Terminal
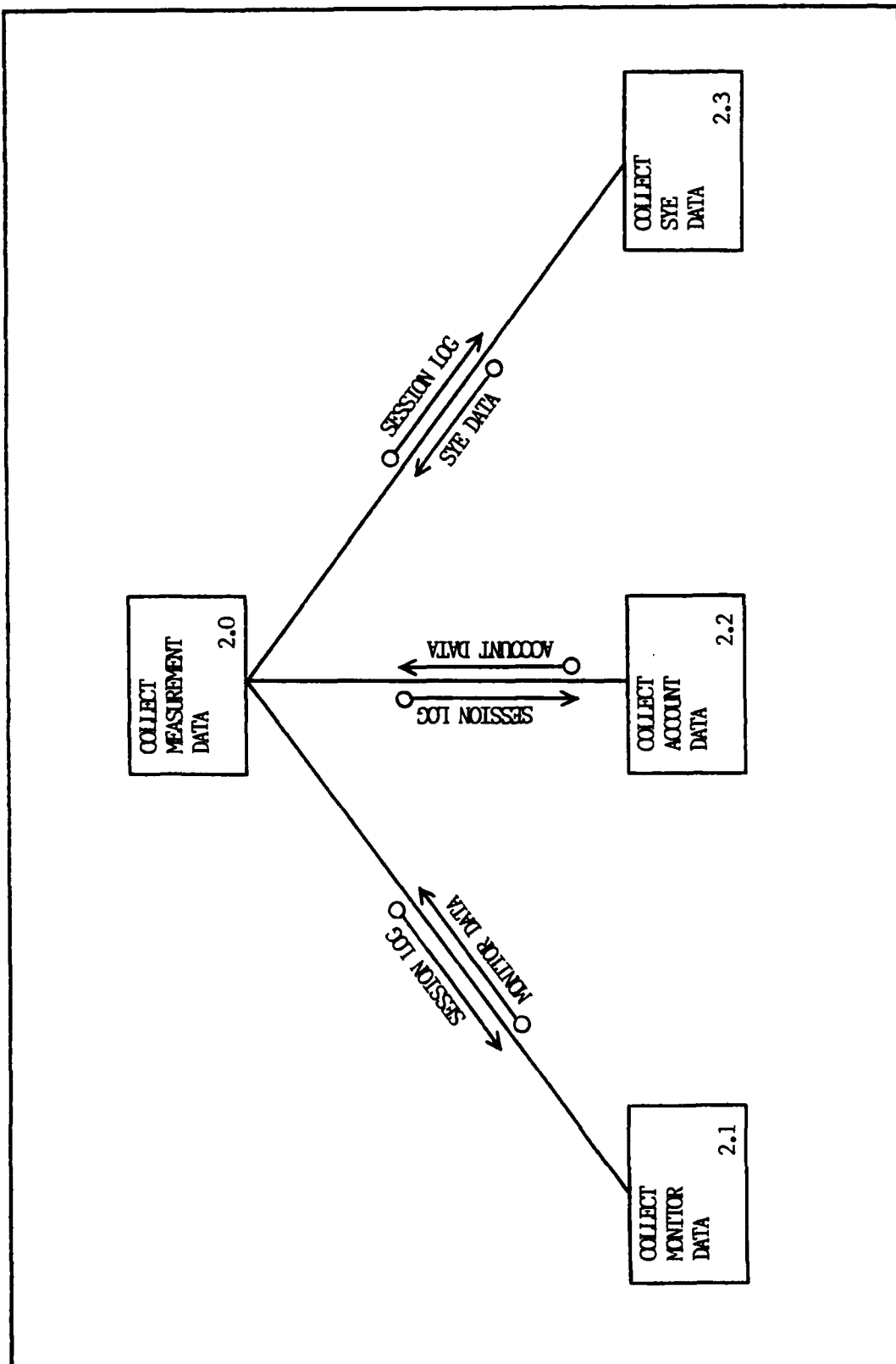
TITLE: COLLECT MEASUREMENT DATA

NODE: 2.0

INITIALIZE MEASUREMENT SESSION 1.0

INITIALIZE DATA FILES 1.2

SET STATUS AS RUNNING 1.1
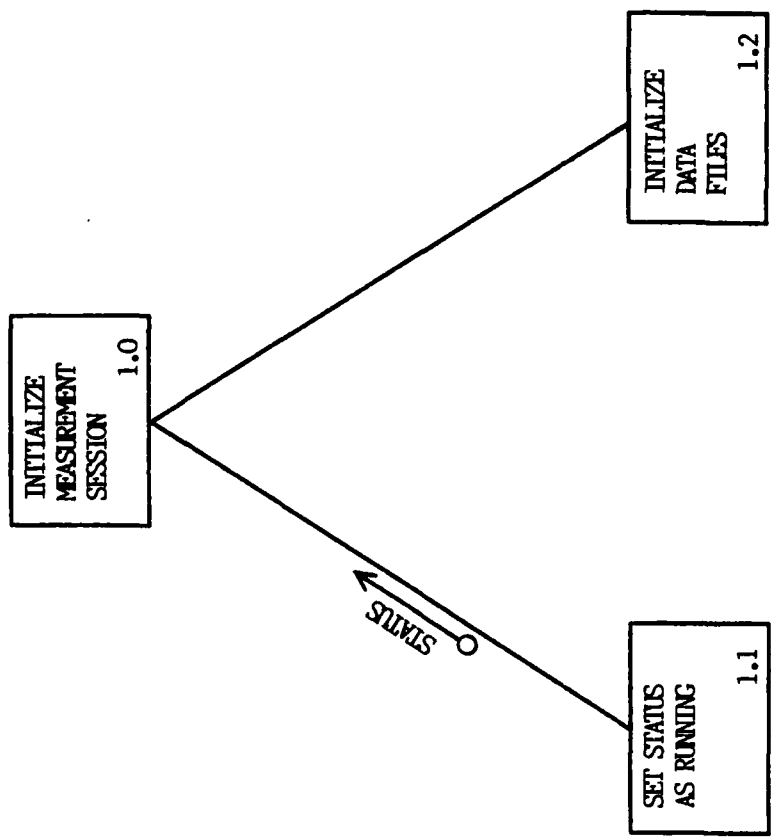
STATUS

NODE: 1.0

TITLE: INITIALIZE MEASUREMENT SESSION
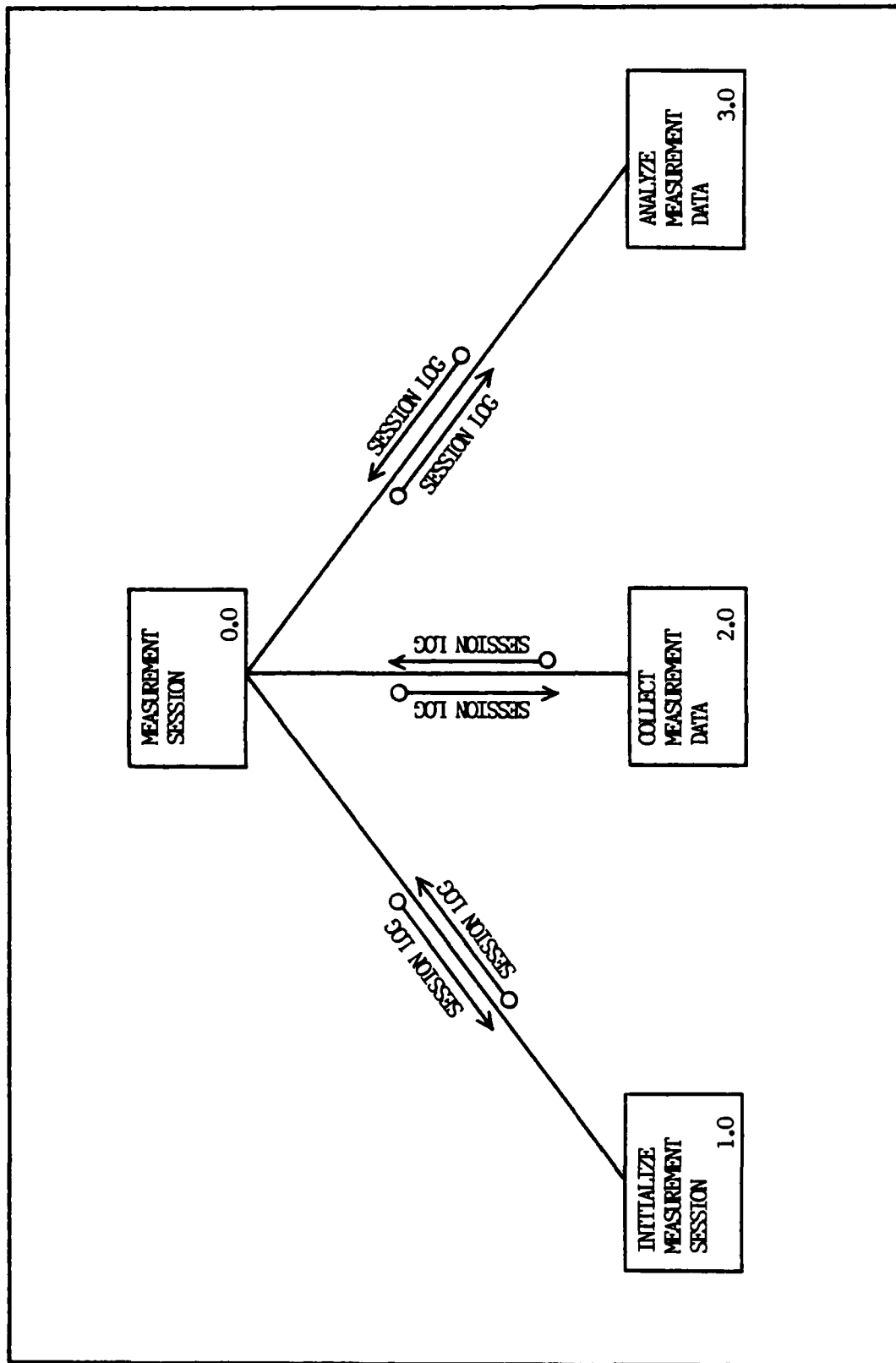
TITLE: MEASUREMENT SESSION

NODE: 0.0

SYSTEMS DESIGN - STRUCTURE CHARTS

Chart Index

0.0 MEASUREMENT SESSION

    1.0   INITIALIZE MEASUREMENT SESSION

        1.1   SET STATUS AS RUNNING
        1.2   INITIALIZE DATA FILES

    2.0   COLLECT MEASUREMENT DATA

        2.1   COLLECT MONITOR DATA
        2.2   COLLECT ACCOUNT DATA
        2.3   COLLECT SYE DATA

    3.0   ANALYZE MEASUREMENT DATA

        3.1   MERGE MEASUREMENT DATA

            3.1.1   FORMAT MONITOR DATA
            3.1.2   FORMAT ACCOUNT DATA
            3.1.3   FORMAT SYE DATA
            3.1.4   SET STATUS AS COMPLETE

        3.2   SORT MEASUREMENT DATA

        3.3   PRINT MEASUREMENT REPORT

            3.3.1   PRINT BANNER
            3.3.2   PRINT EFFECTIVENESS REPORT
            3.3.3   PRINT EFFICIENCY REPORT

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: GRAPHIC DATA

PASSED FROM: 3.1.4.3.1, 3.1.4.3

PASSED TO: 3.1.4.3. 3.1.4.3.2

COMPOSITION:

DESCRIPTION: This   parameter   is   the   measurement   data
selected by the user for graphical display.

ALIASES: None

PART OF: MEASUREMENT DATA

DATA CHARACTERISTICS: Array

VALUES: Character

RELATED SADT DATA ELEMENTS:

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: STATISTICS

PASSED FROM: 3.1.4.2.2

PASSED TO: 3.1.4.2

COMPOSITION:

DESCRIPTION: This parameter is the statistical analysis produced for the user.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Report

VALUES: Character

RELATED SADT DATA ELEMENTS: STATISTICAL ANALYSIS FILES

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: STATISTIC DATA

PASSED FROM: 3.1.4.2.1, 3.1.4.2

PASSED TO: 3.1.4.2, 3.1.4.2.2

COMPOSITION:

DESCRIPTION: This   parameter   is   the   measurement   data
selected by the user for statistical analysis.

ALIASES: None

PART OF: MEASUREMENT DATA

DATA CHARACTERISTICS: Array

VALUES: Character

RELATED SADT DATA ELEMENTS: STATISTICAL ANALYSIS FILES

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: MEASUREMENT REPORT

PASSED FROM: 3.1.4.1.1, 3.1.4.1

PASSED TO: 3.1.4.1, 3.1.4.1.2

COMPOSITION:

DESCRIPTION: This parameter is the consolidated measurement report to be presented to the user of the performance monitor.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: PERFORMANCE MEASUREMENT REPORT

STORAGE TYPE: Global

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: MEASUREMENT DATA

PASSED FROM: 3.1.4. 3.1.4.1, 3.1.4.2, 3.1.4.3

PASSED TO: 3.1.4.1, 3.1.4.2, 3.1.4.3, 3.1.4.1.1, 3.1.4.2.1,
3.1.4.3.1

COMPOSITION:

DESCRIPTION: This parameter is the performance measurement
data produced by a measurement session of the Data Base
Performance Monitor.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: MEASUREMENT DATA FILES

STORAGE TYPE: Global

SYSTEMS DESIGN – STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: STATUS

PASSED FROM: 3.1.2.1, 3.1.2, 3.1.3

PASSED TO: 3.1.2, 3.1.3, 3.1.2.2, 3.1.3.2

COMPOSITION:

DESCRIPTION: This parameter is the status of the current
measurement session.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: String

VALUES: ACTIVE, NOTACTIVE

RELATED SADT DATA ELEMENTS:

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: USERSELECTION

PASSED FROM: 4.0

PASSED TO: 0.0

COMPOSITION:

DESCRIPTION: This parameter is the user input from a menu
selection.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Character

VALUES: Alphabet

RELATED SADT DATA ELEMENTS: USER INPUT

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: MAXSELECTION

PASSED FROM: 0.0

PASSED TO: 4.0

COMPOSITION:

DESCRIPTION: This parameter is the maximum number of
selections on a menu.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Character

VALUES: 1 to maximum screen selections

RELATED SADT DATA ELEMENTS:

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: NAME

PASSED FROM: 0.0

PASSED TO: 3.0

COMPOSITION:

DESCRIPTION: This parameter is the name of the next menu to
be displayed.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Scaler

VALUES: MENUNAME

RELATED SADT DATA ELEMENTS: NEXT SCREEN FORMAT

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: DATE TABLE

PASSED FROM: 0.0

PASSED TO: 1.0

COMPOSITION:

DESCRIPTION: This parameter is used to edit the day and month inputs from the user.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Array

VALUES: Numeric String

RELATED SADT DATA ELEMENTS:

STORAGE TYPE: Global

ANALYZE MEASUREMENT DATA 3.0

MERGE MEASUREMENT DATA 3.1

SORT MEASUREMENT DATA 3.2

PRINT MEASUREMENT REPORT 3.3

MEASUREMENT DATA

MEASUREMENT DATA

MONITOR DATA
SYE DATA
ACCOUNT DATA
MEASUREMENT DATA
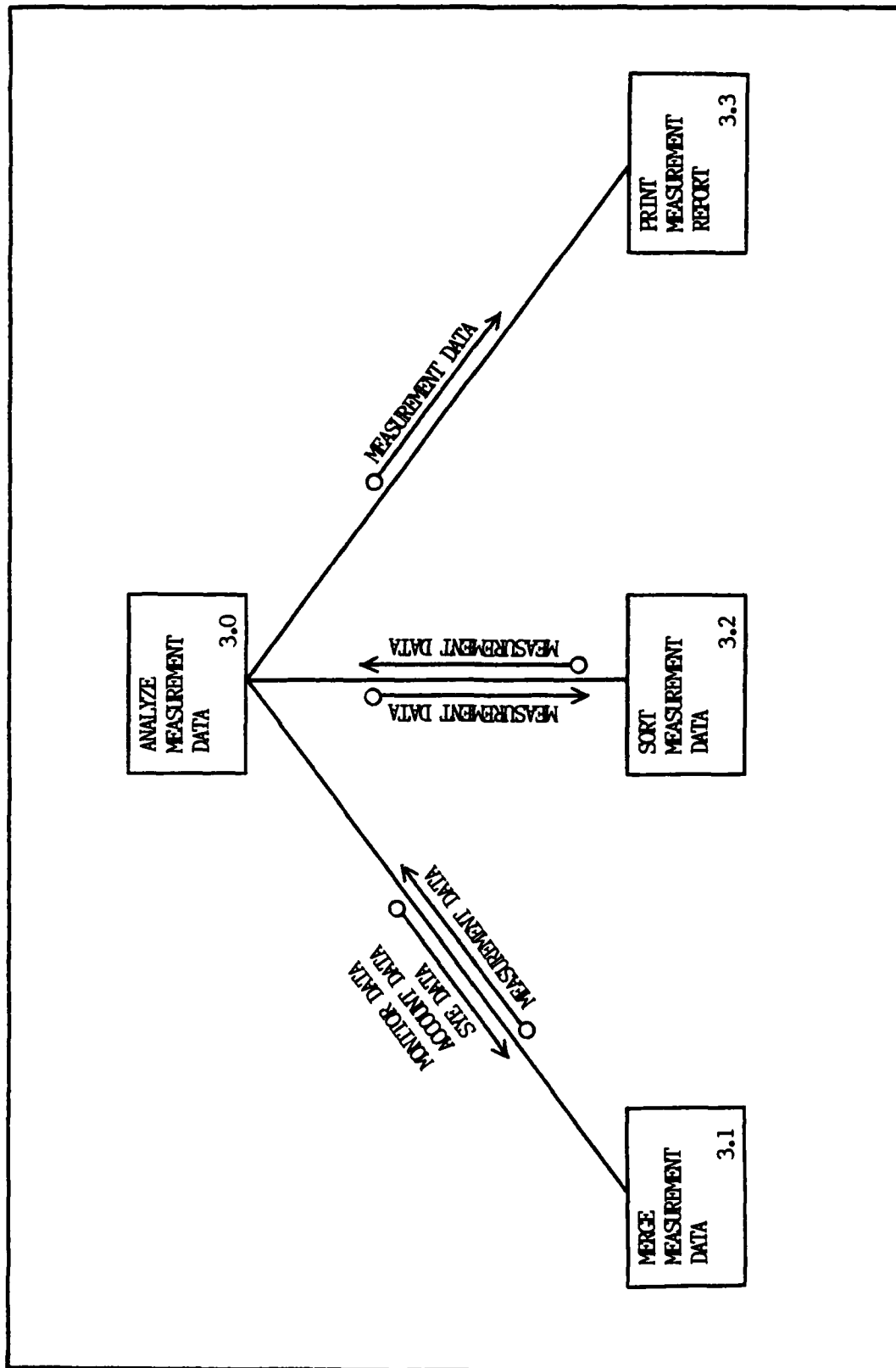
TITLE: ANALYZE MEASUREMENT DATA
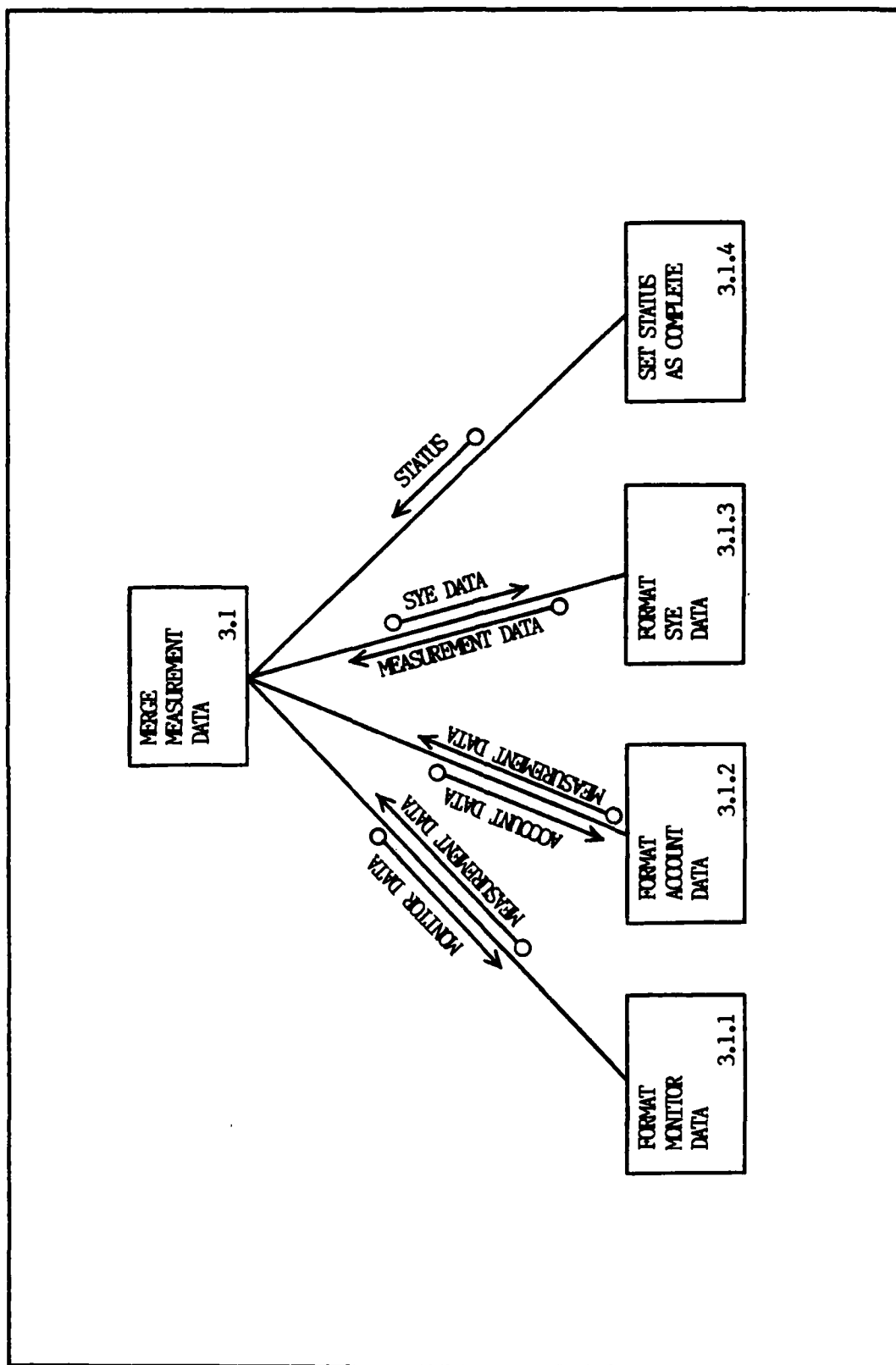
NODE: 3.0

TITLE: MERGE MEASUREMENT DATA

NODE: 3.1

E-57
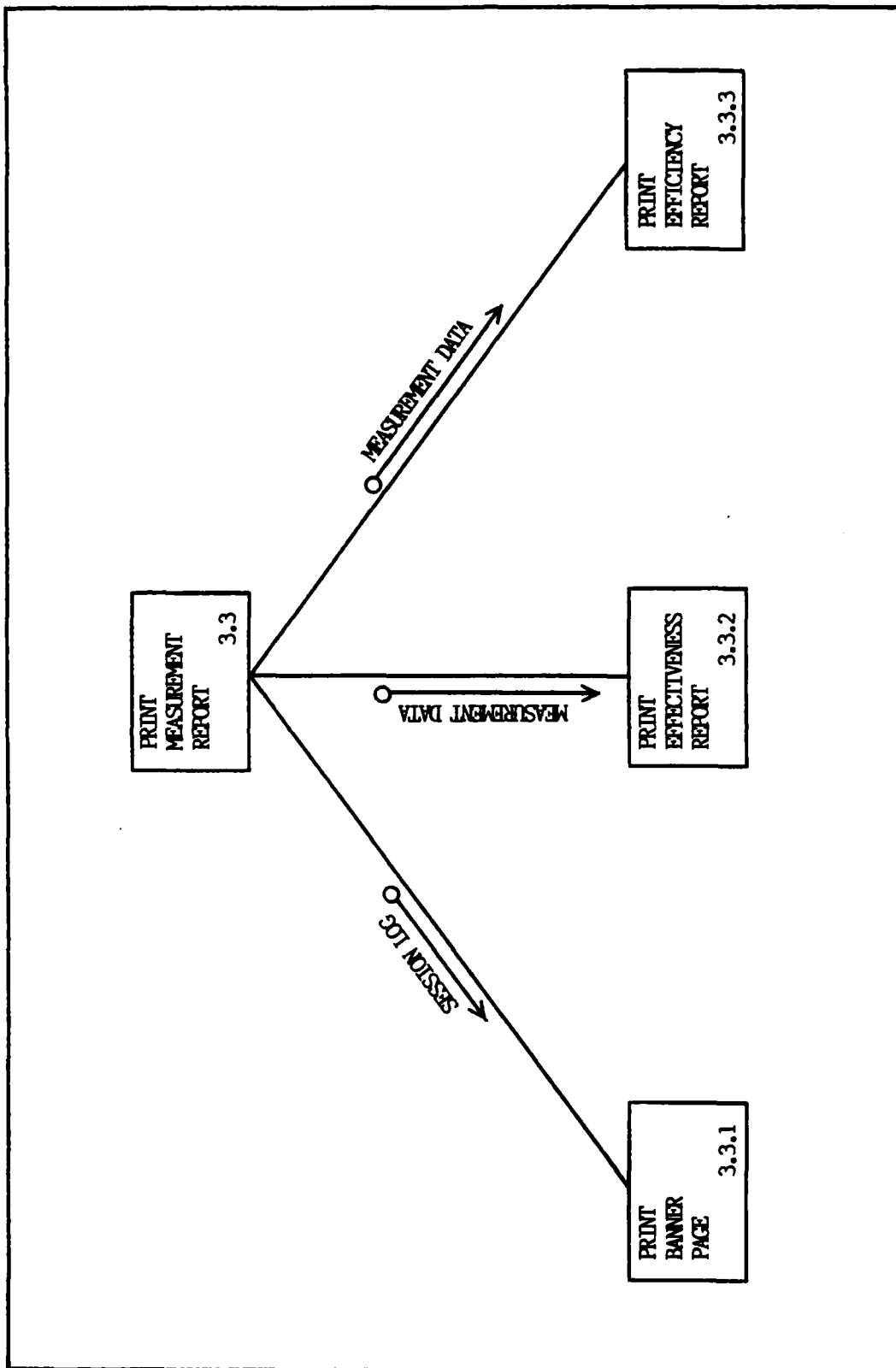
TITLE: PRINT MEASUREMENT REPORT

NODE: 3.3

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 0.0

NAME: MEASUREMENT SESSION

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: SESSION LOG

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process collects and analyzes the DBMON
performance measurement data.

ALIASES: None

RELATED SADT NUMBER: A2, A3

ALGORITHM: None

CALLING PROCESSES: None

PROCESSES CALLED: INITIALIZE MEASUREMENT SESSION,   COLLECT
MEASUREMENT DATA, ANALYZE MEASUREMENT DATA

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 1.0

NAME: INITIALIZE MEASUREMENT SESSION

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: SESSION LOG

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This   process   initializes   the   performance
measurement session.

ALIASES: None

RELATED SADT NUMBER: A23

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: 1.1, 1.2

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 2.0

NAME: COLLECT MEASUREMENT DATA

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: SESSION LOG

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process collects and records measurement data.

ALIASES: None

RELATED SADT NUMBER: A24

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: 2.1, 2.2

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.0

NAME: ANALYZE MEASUREMENT DATA

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: SESSION LOG

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process consolidates and formats the measurement data.

ALIASES: None

RELATED SADT NUMBER: A3

ALGORITHM: None

CALLING PROCESSES: 0.0

PROCESSES CALLED: 3.1, 3.2, 3.3

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 1.1

NAME: SET STATUS AS RUNNING

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: STATUS

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process sets the measurement session status as running.

ALIASES: None

RELATED SADT NUMBER: A23

ALGORITHM: None

CALLING PROCESSES: 1.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 1.2

NAME: INITIALIZE DATA FILES

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process initializes the measurement data
files.

ALIASES: None

RELATED SADT NUMBER: A23

ALGORITHM: None

CALLING PROCESSES: 1.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 2.1

NAME: COLLECT MONITOR DATA

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: MONITOR DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process collects performance monitor
data.

ALIASES: None

RELATED SADT NUMBER: A24

ALGORITHM: None

CALLING PROCESSES: 2.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 2.2

NAME: COLLECT ACCOUNT DATA

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: ACCOUNT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process collects performance accounting
data.

ALIASES: None

RELATED SADT NUMBER: A24

ALGORITHM: None

CALLING PROCESSES: 2.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 2.3

NAME: COLLECT SYE DATA

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: SYE DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process collects system error data.

ALIASES: None

RELATED SADT NUMBER: A24

ALGORITHM: None

CALLING PROCESSES: 2.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1

NAME: MERGE MEASUREMENT DATA

INPUT DATA: MONITOR DATA, ACCOUNT DATA, SYE DATA

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process merges and formats data from the measurement utilities.

ALIASES: None

RELATED SADT NUMBER: A31

ALGORITHM: None

CALLING PROCESSES: 3.0

PROCESSES CALLED: 3.1.1, 3.1.2, 3.1.3, 3.1.4

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.2

NAME: SORT MEASUREMENT DATA

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process sorts the measurement data for
presentation to the user.

ALIASES: None

RELATED SADT NUMBER: A31

ALGORITHM: None

CALLING PROCESSES: 3.0

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: SYE DATA

PASSED FROM: 2.3, 3.0, 3.1

PASSED TO: 2.0, 3.1, 3.1.3

COMPOSITION:

DESCRIPTION: This parameter contains the data collected from the system error utility.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: MEASUREMENT DATA FILES

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: ACCOUNT DATA

PASSED FROM: 2.2, 3.0, 3.1

PASSED TO: 2.0, 3.1, 3.1.2

COMPOSITION:

DESCRIPTION: This parameter contains the data collected from
the accounting utility.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: MEASUREMENT DATA FILES

STORAGE TYPE: Passed

SYSTEMS DESIGN – STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: ACCOUNT DATA

PASSED FROM: 2.2, 3.0, 3.1

PASSED TO: 2.0, 3.1, 3.1.2

COMPOSITION:

DESCRIPTION: This parameter contains the data collected from the accounting utility.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: MEASUREMENT DATA FILES

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: MONITOR DATA

PASSED FROM: 2.1, 3.0, 3.1

PASSED TO: 2.0, 3.1, 3.1.1

COMPOSITION:

DESCRIPTION: This parameter contains the data collected from the monitor utility.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: MEASUREMENT DATA FILES

STORAGE TYPE: Passed

SYSTEMS DESIGN – STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: STATUS

PASSED FROM: 1.1, 3.1.4

PASSED TO: 1.0, 3.1

COMPOSITION:

DESCRIPTION: This parameter is the current status of the measurement session.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Scaler

VALUES: READY, NOTREADY, RUNNING, COMPLETE, ERROR

RELATED SADT DATA ELEMENTS:

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: SESSION LOG

PASSED FROM: 0.0, 1.0, 2.0, 3.0

PASSED TO: 1.0, 2.0, 3.0, 2.1, 2.2, 2.3, 3.3.1

COMPOSITION:

DESCRIPTION: This parameter contains the description of the measurement session.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: Record

VALUES: Character

RELATED SADT DATA ELEMENTS: PRESENTATION COMMANDS, ANALYSIS COMMANDS, MEASUREMENT CONTROL COMMANDS

STORAGE TYPE: Passed

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.3.3

NAME: PRINT EFFICIENCY REPORT

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process prints the Efficiency section of
the Performance Mesurement Report.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.3.2

NAME: PRINT EFFECTIVENESS REPORT

INPUT DATA: MEASUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process prints the Effectiveness section
of the Performance Mesurement Report.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.3.1

NAME: PRINT BANNER

INPUT DATA: SESSION LOG

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process prints the banner page of the performance measurement report.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.3

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.4

NAME: SET STATUS AS COMPLETE

INPUT DATA: None

INPUT FLAGS: None

OUTPUT DATA: STATUS

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process sets the mesurement session
status as complete.

ALIASES: None

RELATED SADT NUMBER: A2, A3

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.3

NAME: FORMAT SYE DATA

INPUT DATA: SYE DATA

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process formats the data form the System
Error utility.

ALIASES: None

RELATED SADT NUMBER: A31

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.2

NAME: FORMAT ACCOUNT DATA

INPUT DATA: ACCOUNT DATA

INPUT FLAGS: None

OUTPUT DATA: MEASUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process formats the data from the account
utility.

ALIASES: None

RELATED SADT NUMBER: A31

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.1.1

NAME: FORMAT MONITOR DATA

INPUT DATA: MONITOR DATA

INPUT FLAGS: None

OUTPUT DATA: MESUREMENT DATA

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This process formats the data from the monitor
utility.

ALIASES: None

RELATED SADT NUMBER: A31

ALGORITHM: None

CALLING PROCESSES: 3.1

PROCESSES CALLED: None

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: None

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PROCESS

DATE: 1 Aug 84

NUMBER: 3.3

NAME: PRINT MEASUREMENT REPORT

INPUT DATA: MESUREMENT DATA

INPUT FLAGS: None

OUTPUT DATA: None

OUTPUT FLAGS: None

GLOBAL DATA USED: None

GLOBAL DATA CHANGED: None

DESCRIPTION: This   process   prints   the   Performance
Measurement Report.

ALIASES: None

RELATED SADT NUMBER: A4

ALGORITHM: None

CALLING PROCESSES: 3.0

PROCESSES CALLED: 3.3.1, 3.3.2, 3.3.3

FILES READ: None

FILES WRITTEN: None

HARDWARE READ: None

HARDWARE WRITTEN: PRINTER

SYSTEMS DESIGN - STRUCTURE CHARTS

TYPE: PARAMETER

DATE: 1 Aug 84

NAME: MEASUREMENT DATA

PASSED FROM: 3.1, 3.2, 3.0, 3.1.1, 3.1.2, 3.1.3, 3.3

PASSED TO: 3.0, 3.2, 3.3, 3.1, 3.3.2, 3.3.3

COMPOSITION:

DESCRIPTION: This parameter contains the analyzed data from the measurement session.

ALIASES: None

PART OF:

DATA CHARACTERISTICS: File

VALUES: Character

RELATED SADT DATA ELEMENTS: ANALYZED MEASUREMENT DATA FILES

STORAGE TYPE: Passed

```
DDDDD     BBBBB     M      M      OOO      N    N
D    D    B    B    MM    MM     O   O     NN   N
D     D   BBBBB     M M  M M    O     O    N N  N
D     D   B    B    M  MM  M    O     O    N  N N
D    D    B    B    M      M     O   O     N   NN
DDDDD     BBBBB     M      M      OOO      N    N
```

DBMS PERFORMANCE MONITOR

VERSION 2.0

Developed at the Air Force Institute of Technology

Wright-Patterson Air Force Base, Ohio 45433

Copyright 1984 by Electrical Engineering Dept (AFIT/EN)

Capt Timothy D. Bruner, USAF

Capt Paul D. Bailor, USAF

Advisor Dr. Gary Lamont

December 1984

DBMON Users Manual

Introduction

This appendix contains a preliminary Users Manual for Version 2.0 of DBMON (DBMS performance Monitor). It contains a description of DBMON, instructions for installing DBMON, and operational procedures for DBMON. As of this writing, DBMON is only partially implemented; therefore, this preliminary version will also provide information to software engineers continuing the DBMON development effort.

Scope

The scope of this manual is limited to describing the DBMON software system. It assumes the reader has a basic knowledge of the VAX computer, VMS operating system, and TOTAL DBMS. No attempt is made to explain any of these items, and if any questions should arise, the reader should consult the appropriate DEC or CINCOM manuals.

DBMON Description

DBMON is a Data Base Management System (DBMS) performance monitor for the TOTAL DBMS and VAX computer. DBMON is composed of four VAX utilities and seven programs, and its overall composition is illustrated in Figure 1. In this figure, VAX utilities are denoted by a (U), and the four developed programs are denoted by a (P). In addition to showing DBMON's composition, this figure shows the four execution stages of DBMON, and each stage is explained below.

Stage 1 (User Interface). In this stage, the user interface program is executed to specify a measurement session. A measurement session is defined as the period of time the performance tools making up DBMON are to be active and collecting performance parameter values. Therefore, the user interface serves as the means for entering values to specify the data collection time period and the execution options of the performance tools. After these values have been successfully entered, the user interface produces a VAX command procedure to control the execution of the DBMON system. Individual statements in the command procedure are used to control the programs and VAX utilities making up DBMON.
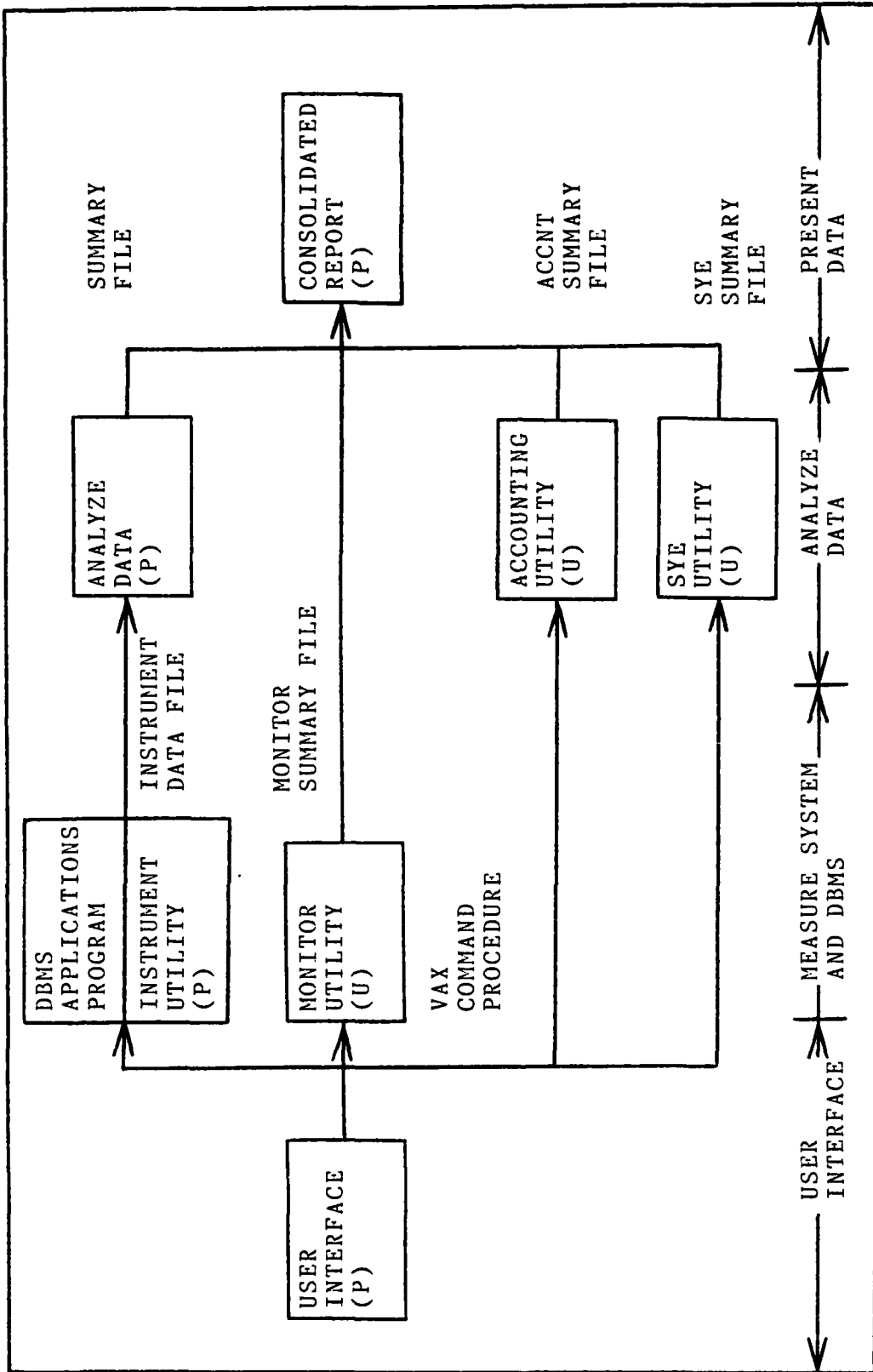
Figure 1 - DBMON Composition.

Stage 2 (Measure System and DBMS). In this stage, the VAX Monitor Utility and the instrumentation utility are used to collect performance parameter values. The monitor utility executes for the duration of the measurement session, and it produces a summary of the collected values. The instrumentation utility is executed as requested by individual DBMS applications programs, and it produces a raw data file each time it is executed.

Stage 3 (Analyze Data). In this stage, raw data files are analyzed, and summary files are produced. VAX utilities are used to extract and summarize the necessary performance parameter values from the system accounting and error log files. Additionally, the individual data files produced by the instrumentation utility are merged and analyzed by a data analysis (reduction) program to produce a summary file.

Stage 4 (Present Data). In this stage, all summary files are consolidated and used to produce a performance measurement report.

DBMON Status

As of this writing, DBMON is only partially complete, but enough pieces have been developed and tested to make DBMON a useful performance measurement tool. It is capable of providing detailed pictures of the overall performance of the VAX computer and the TOTAL DBMS.

Installation Requirements

A target VAX computer for DBMON must satisfy the following requirements.

1. It must use the VAX/VMS operating system.
2. It must have the Monitor, Accounting, and SYE utilities.
3. It must have at least 500 free blocks of disk storage available.

Installation Procedures

The first installation step is setting up an account and directory for users of DBMON. Since DBMON is intended to be a stand-alone system, it is recommended that a separate account and disk directory be established, and the account should set the default directory to the DBMON directory.

UIC Requirements. Parts of the DBMON system require access to the system error log files. Specifically, the command procedure generated by the user interface must access the system error log files. Since this file can only

be accessed by users with system privileges, the username generating the command procedure must have system privileges Therefore, the username and password combination established for the DBMON account requires system privileges.

The remaining parts of the DBMON system do not require system privileges for execution. However, there is a UIC requirement associated with the instrumentation utility. The instrumentation utility can only be used by those users with system privileges or those users with a username whose UIC is in the same group as the TOTAL DBMS.

DBMON Directory. A separate DBMON directory should be created on a disk volume. If possible, this should not be the same volume as the one containing the TOTAL DBMS; otherwise, the TOTAL DBMS and DBMON system will both be contending for the same disk volume and adding additional overhead to the computer system. The UIC for the DBMON directory must be set so that all users of the TOTAL DBMS have access for reading and writing of the data files within the directory. Therefore, it is recommended the UIC of the DBMON directory be in the same group as the UIC of the TOTAL DBMS.

After the DBMON account and directory have been created, the software can be installed from the BACKUP tape by entering the following commands.

```
$SET UIC [nnn,nnn]
$MOUNT/FOREIGN <tdev-name>:
$BACKUP <tdev-name>:DBMON>BAK/SELECT=[DBMON] -
<ddev-name>:[DBMON]
```

where <tdev-name> corresponds to a valid tape device name (e. g. MSA0:), and <ddev-name> corresponds to a valid disk device name (e.g. DMA1:).

The UIC specified in the SET UIC command should be the same UIC the DBMON directory was created with. After the BACKUP command has completed, a DIRECTORY command should be performed on the DBMON directory, and at least the following files must be present, where n corresponds to a version number.

DBMON.PAS;n	SCREENLIB.pas;n
INSTRUTIL.MAR;n	ANALDATA.PAS;n
DBMONINIT.COM;n	SESSION.LOG;n
SETRUN.PAS;n	MERGDATA.PAS;n
PRTREPORT.PAS;n	

The next installation step is to examine the DBMON.PAS, INSTRUTIL.MAR, SETRUN, MERGDATA, PRTREPORT, and

ANALDATA.PAS source code to ensure file compatability. In
the DBMON.PAS program, the program constants shown below
must be verified to ensure device name and UIC compatibility.

```
        ERRORFILES              = 'DUAO:[SYSO.SYSERR]';
        DATAFILES               = 'DUA1:[DBMON]';
        UICCODE                 = '[200,050]';
```

Additionally, the two OPEN() statements in the procedure
CREATECOMMANDS must be verified to ensure device name
compatibility. In the INSTRUTIL.MAR program, the $FAB macro
specification must be verified to ensure device name
compatibility for the DBMON directory. This statement is
shown below.

```
    DATAFILE:  $FAB    FNM=<DUA1:[DBMON]INSTR.DAT>,FAC=PUT
```

In the ANALDATA.PAS program, the OPEN() statements must be
verified to ensure device name compatibility for the DBMON
directory. If the pre-supplied device names are incorrect
in any of the programs, the source code must be edited to
supply the correct device name. If your system does not use
VT100 terminals, the escape sequences in the SCREENLIB.PAS
module may need to be examined to ensure terminal
compatibility. For example, the VT100 escape sequence for
positioning the cursor, and its PASCAL implementation are:

    VT100 Sequence:

        Esc[Pn;Pnf

    where   Pn;Pn   is the   ASCII representation of the
row;column number to position the cursor.

    PASCAL Implementation:

```
    WRITE(OUTPUT,CHR(27),'[',ROWTENS,ROWONES,';',
          COLTENS,COLONES,'f');
```

    where CHR(27) produces the Esc character, and ROWTENS
and ROWONES are character variable names representing the
tens position of the row number and the ones position of the
row number respectively.

    The final installation step is to create executable
files for the programs. The command sequence that follows
will perform this task, and the DBMON system is now ready
for use.

```
$PASCAL SCREENLIB
$PASCAL DBMON
$LINK DBMON,SCREENLIB
$PASCAL ANALDATA
$LINK ANALDATA
$PASCAL SETRUN
$LINK SETRUN
$PASCAL MERGDATA
$LINK MERGDATA
$PASCAL PRTREPORT
$LINK PRTREPORT
$MACRO INSTRUTIL
```

DBMON Operational Procedures

The DBMON user interface was specifically designed to be a "user friendly" interface. The special features of the VT100 terminal were used to achieve this goal, and they greatly enhance the appearance, readibility, and understandibility of the screen formats. For example, menus are titled, and the title is always displayed in double height characters centered in lines 2 and 3. Data entry prompts are labelled, and the labels are always displayed in reverse video. Error messages are always displayed in double height characters in lines 23 and 24. Because of these simple conventions, screen formats are not completely reproduced in this users manual; however, enough information is always given to make it clear which screen format is being described.

To use the DBMON system, the user interface is executed first, and this is done by logging onto the VAX computer under the username/password combination established for the DBMON account and entering the command:

$RUN DBMON

This command initiates the user interface and the DBMON welcome screen will appear. The user should verify that the version number is correct (VERSION 2.0) and push the return key to obtain the main menu.

The Main Menu is the control point of the user interface, and it contains the following options.

```
1..SPECIFY MEASUREMENT SESSION
2..DELETE MEASUREMENT SESSION
3..SHOW STATUS OF MEASUREMENT SESSION
4..ANALYZE PERFORMANCE DATA
5..EXIT PROGRAM
```

OPTION 1 - This option allows a measurement session to be specified, and is will cause a series of menus and data entry prompts to be displayed. The menus and data entry prompts are explained in the Specifying a Measurement Session section below.

OPTION 2 - The function of this option is to allow a user to delete a measurement session that is currently executing or waiting to be executed.

OPTION 3 - The function of this option is to allow a user to inspect the status of a measurement session, such as: hibernating, collecting performance data, analyzing data, completed, etc..

OPTION 4 - This option allows the performance data to be displayed to the user. The data is displayed in the form of a performance report with the user selecting the performance measurement and performance index.

OPTION 5 - This option terminates the user interface, and it causes an informational message to be displayed. If a measurement session was successfully specified, instructions for initiating the DBMON system are displayed, and these instructions are shown below.

```
TO BEGIN MONITOR EXECUTION
ENTER THE FOLLOWING VAX/VMS COMMAND
$SUBMIT/NOLOG_FILE [DBMON]DBMONINIT
```

The submit command submits the VAX command procedure generated by the user interface program (contained in the file DBMONINIT.COM) to the batch job queue SYS$BATCH. The DBMON system will hibernate until the specified start date and time, and when the start date and time are reached, the DBMON system will begin execution as a background batch job. If a measurement session was not specified, the information message

NO MONITOR SESSION ESTABLISHED

will be displayed.

Selecting a Menu Option. A menu option is selected by entering the number of the menu option and pressing the return key. The edit criteria and error messages pertaining to selecting a menu option are described below, and these are standardized for all menus in the User Interface.

. Edit Criteria and Error/Warning Messages.

        1. Menu selection must be one of the numbers displayed in the menu. Error Message - SELECTION INVALID -- PLEASE TRY AGAIN

        2.   Menu selection must be implemented. Warning Message - MENU SELECTION NOT IMPLEMENTED YET

    NOTE: At any time the user interface can be aborted by using a CTRL C sequence.

Specifying a Measurement Session

    To specify a measurement session, the following sequence of steps must be successfully completed, and each step is discussed in the following paragraphs.

        STEP 1.   Select a performance parameter set option
        STEP 2.   Enter data specifying performance tool parameters.
        STEP 3.   Select a data analysis option.
        STEP 4.   Select a data presentation option.
        STEP 5.   Verify the selected options and entered data.

    Selecting a Performance Parameter Set Option. The Parameters Menu is used to select this option, and this menu contains the following options.

        1..MEASURE ALL PARAMETERS
        2..MEASURE SOFTWARE ENGINEER'S SUBSET
        3..MEASURE DBA'S SUBSET (DETAILED VIEW)
        4..MEASURE SYSTEM MANAGER'S SUBSET
        5..MEASURE DBA'S SUBSET (HIGH LEVEL VIEW)
        6..MEASURE DBMS DESIGNER'S SUBSET
        7..SELECT A SPECIALIZED SUBSET
        8..RETURN TO MAIN MENU

    OPTION 1 - This option selects all possible performance parameters for measurement.

    OPTION 2 through 7 - These options allow users to select pre-defined or specially defined performance parameter subsets for measurement.

    OPTION 8 - This option cancels a request to specify a measurement session and returns the user to the main menu.

Enter Data Specifying Performance Tool Parameters. This data is used to specify control information for use by the VAX utilities and other programs making up the DBMON system. This data is entered through a sequence of six data entry prompts. Each data entry prompt explains the purpose of the prompt, the required data format, and example entry, and a default value. To facilitate the data entry process, the current system data and time are displayed in double height characters at the top of the display.

Select a Data Analysis Option. The Data Analysis menu is used to select this option, and this menu contains the following options.

        1..STANDARD ANALYSIS
        2..RETURN TO MAIN MENU

        OPTION 1 - This option selects the data analysis performed by the VAX utilities and data analysis program. All of this analysis has been pre-selected; hence, no data analysis options really exist. The reason for this is that no acceptable math-statistical package existed on the development system. In the future, this menu is to be extended to allow data files to be further analyzed by a math-statistical package.

        OPTION 2 - This option cancels a request to specify a measurement session and returns a control to the main menu.

Select a Data Presentation Option. The Data Presentation menu is used to select this option, and this menu contains the two options.

        1..PRINT MEASUREMENT REPORT
        2..RETURN TO MAIN MENU

        OPTION 1 - This option prints the measurement report on the system printer.

        OPTION 2 - This option cancels a request to specify a measurement session and returns control to the main menu.

<u>Verify the Selected Menu Options and Entered Data</u>.
The Measurement Session Information screen displays all the
menu options and data entered by the user. At the bottom of
the display, the prompt

DO YOU WISH TO CHANGE ANY INFORMATION (Y/N) >

is displayed. If the response to the prompt is N, the VAX
command procedure and session log record are created, and
the user is returned to the main menu.
        If the response is Y, the Change Information
Menu is displayed, and this menu contains the following
options.

        1..CHANGE MEASUREMENT SESSION NAME
        2..CHANGE START DATE
        3..CHANGE START TIME
        4..CHANGE STOP DATE
        5..CHANGE STOP TIME
        6..CHANGE DATA COLLECTION INTERVAL
        7..RE-DISPLAY SESSION INFORMATION

        OPTIONS 1 through 6 - These options are used to
change individual items of information. To change
information, the data entry prompts are re-displayed along
with the current value of the data. Additionally, the title
Changing Information is displayed in double height
characters at the top of the screen.

        OPTION 7 - When all the changes have been made,
this option should be selected, and it returns to the
Measurement Session Information screen. The information
should be reviewed and the Y or N should be entered as
required.

<u>Using the Instrumentation Utility</u>
        The Instrumentation Utility is a set of three external
procedures (subroutines) written in MACRO-11 Assembly
Language, and they are used in conjunction with a DBMS
applications program to obtain detailed performance
information on the TOTAL DBMS at the DML statement level.
        To use this utility, the DBMS applications program
must be modified to define the three external procedures
(subroutines), and calls to the procedures are interspersed
in the applications program. The calls allow performance
information to be collected and recorded in a data file.
The names of the three procedures and the functions they
perform are described below. Figure 2 provides an example of
how the instrumentation utility is incorporated into the
source code of a PASCAL DBMS applications program.

F-10

1.   INITUTILITY - This procedure initializes the instrumentation utility and creates a data file for accumulating performance parameter values.   This procedure is typically called once before the data base signon request is sent to the TOTAL DBMS, and the other two procedures are called on a DML by DML statement basis.   However, the capability does exist to call this procedure more than once, thereby, creating more than one data file.   This capability provides the flexibility to tailor the contents of the data file for use in specially designed performance tests.   Two parameters, the program and data base names, are inputs to this procedure, and a completion status is the output from the procedure.   The two input parameters are PASCAL string types, and they can be represented either as a literal or variable name.   Since the status is supplied by the external procedures, a variable name must be specified for the output parameter. (NOTE: The VAR specifier must not be used when defining the external procedures.   The string descriptor mechanism automatically passes the address of the string to the external procedures.   Whether or not the data at this address is modified is controlled by the logic of the external procedure.)

2.   MEASUREDBMS - This procedure records the state of the DBMS just prior to the execution of DML statement or group of DML statements, and a call to this procedure should immediately precede a DML statement.   In the case of the TOTAL DBMS, a call to this procedure immediately precedes a call to the DATBAS subroutine.   Two parameters, the name of the DBMS function (DML statement) and the name of the data base file, are inputs to this procedure, and a completion status is the output from the procedure.   The two input parameters are PASCAL string types, and they can be represented either as a literal or variable name.   Since the status is supplied by the external procedures, a variable name must be specified for the output parameter.

3.   ENDMEASURE -. This procedure records the state of the DBMS just after the execution of a DML statement or group of DML statements, and a call to this procedure should immediately follow a call to the DATBAS subroutine.   One parameter, the endcode, is the input to this procedure, and a completion status is the output from the procedure.   The input parameter is a PASCAL string type, and it can be represented either as a literal or variable name.   Since the status is supplied by the external procedures, a variable name must be specified for the output parameter.   Only two values are defined for the endcode.   The first value is 'ENDDML' and this code denotes the end of a DML or group of DML statements, allowing additional calls to be made to the instrumentation utility.   The second value is 'ENDPRG' and

his code denotes the end of a measurement session. It auses the data file to be closed, and the instrumentation tility is disabled. Therefore, the procedure INITUTILITY ust be called to re-enable it.

Two status codes are returned by the procedures. A uccessful completion is indicated by the value '****', and his is consistent with the successful completion code of he TOTAL DBMS. An error condition is indicated by the alue 'EROR'. In addition to returning the error condition, he instrumentation utility is disabled. Therefore, dditional calls to the procedures MEASUREDBMS and NDMEASURE will have no effect until the instrumentation tility is re-initialized by calling the procedure NITUTILITY.

After the applications program has been recompiled, he object module for the instrumentation utility must be ncluded in the LINK command, and an example of this is hown below.

```
$LINK <program-name>,<dev>:[DBMON]INSTRUTIL, -
<dev>;[TOTAL]NATDATBAS,NATBUF
```

The applications program is now ready for execution; owever, careful attention must be paid to the UIC of the sername executing the applications program. The UIC of the sername must have system privileges or be in the same group s the username submitting the TOTALINIT job. Otherwise, he instrumentation utility will be unable to access the ables maintained by the VMS operating system.

The data recorded by the instrumentation utility is ccumulated in the file INSTR.DAT, and this file is analyzed y a separate data analysis program (ANALDATA.PAS). Each ime the instrumentation utility is executed, a new version f the file INSTR.DAT is created, and typically, all the raw ata files are merged together and analyzed at the end of a easurement session. However, the capability exists to run he instrumentation utility and data analysis program in a tand-alone mode from the DBMON system, but this should ever be atempted while a DBMON session is active. The roblem occurs when trying to identify which of the possibly any versions of the INSTR.DAT file is the file created in he stand-alone mode. When using the stand-alone mode, the ata files produced by the instrumentation utility must be anually merged into the filename DATAFILE.DAT. The merging an be performed by the VMS COPY command or by using the ENAME command on individual files.
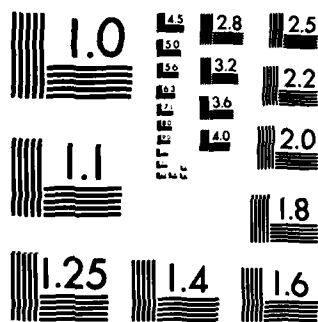
MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

```
PROGRAM COURSEDATA(INPUT,OUTPUT);

TYPE

    BUFF4  = PACKED ARRAY [1..4] OF CHAR;
    BUFF5  = PACKED ARRAY [1..5] OF CHAR;
    BUFF6  = PACKED ARRAY [1..6] OF CHAR;
    BUFF15 = PACKED ARRAY [1..15] OF CHAR;

PROCEDURE INITUTILITY(%STDESCR PROGRAMNAME : BUFF15;
                      %STDESCR DATABASENAME : BUFF6;
                      %STDESCR STATUS : BUFF4);
                      EXTERN;

PROCEDURE MEASUREDBMS(%STDESCR DBMSFUNCTION : BUFF5;
                      %STDESCR DBMSFILENAME : BUFF4;
                      %STDESCR STATUS : BUFF4);
                      EXTERN;

PROCEDURE ENDMEASURE(%STDESCR ENDCODE : BUFF6;
                     %STDESCR STATUS : BUFF4);
                     EXTERN;

PROCEDURE GETCOURSEDATA;

    PROCEDURE DATABAS(Call Parameters...); EXTERN;

BEGIN

    COMMAND := 'READM';
    FNAME := 'CRSE';
    MEASUREDBMS(COMMAND,FNAME,STATCODE);
    DATABAS(Parameters comprising a DML statement);
    ENDMEASURE('ENDDML',STATCODE);

END;  (* PROCEDURE GETCOURSEDATA *)

BEGIN (* MAIN PROGRAM *)

    INITUTILITY('UPDATECOURSES  ','AFITDB',STATCODE);
    GETCOURSEDATA;

END.
```

Figure 2 - Using the Instrument Utility in a PASCAL Program.

DBMON Output

    The output of the DBMS performance monitor is two reports, the Measurement Report and the Instrument Report. The Measurement Report is a consolidated report from the performance measurement session. A sample page of the Measurement Report is shown in Figure-3. The Instrument Report is the report generated from the Instrument Utility performance data. A sample page from this report is shown in Figure-4. Each of the reports can be displayed at the user terminal and/or printed on the system printer.

DML STATEMENT SUMMARY

RETRIEVAL COMMANDS

COMMAND NAME	TYPE INFORMATION	EXECUTION COUNT	RESPONSE TIME(SECS)	CPU TIME(MSEC)	BUFFERED I/O	DIRECT I/O	PAGE FAULTS	WORKING SET
RDNXT	TOTAL AVERAGE	511	15.160 0.030	5889 11.5	1822 2.0	386 0.6	18 0.0	100 100.0
READN	TOTAL AVERAGE	37	2.010 0.054	520 14.1	74 2.0	37 1.0	2 0.1	100 100.0
READU	TOTAL AVERAGE	1172	22.920 0.020	11510 9.8	2344 2.0	118 0.1	8 0.0	100 100.0
-SUM-	TOTAL AVERAGE	1720	40.090 0.023	17910 10.4	3440 2.0	453 0.3	28 0.0	100 100.0

STORAGE COMMANDS

NO STORAGE COMMANDS EXECUTED

CONTROL COMMANDS

COMMAND NAME	TYPE INFORMATION	EXECUTION COUNT	RESPONSE TIME(SECS)	CPU TIME(MSEC)	BUFFERED I/O	DIRECT I/O	PAGE FAULTS	WORKING SET
SINON	TOTAL AVERAGE	2	3.060 1.530	1540 770.0	33 16.5	28 14.0	2116 1058.0	100 100.0
SINOF	TOTAL AVERAGE	2	3.330 1.665	940 470.0	18 9.0	28 14.0	1361 680.5	100 100.0
-SUM-	TOTAL AVERAGE	4	6.390 1.597	2480 620.0	51 12.8	56 14.0	3477 869.3	100 100.0

SPECIAL PURPOSE COMMANDS

NO SPECIAL PURPOSE COMMANDS EXECUTED

SUMMARY OF ALL COMMANDS

COMMAND NAME	TYPE INFORMATION	EXECUTION COUNT	RESPONSE TIME(SECS)	CPU TIME(MSEC)	BUFFERED I/O	DIRECT I/O	PAGE FAULTS	WORKING SET
-SUM-	TOTAL AVERAGE	1724	46.480 0.027	20390 11.8	3491 2.0	589 0.3	3505 2.0	100 100.0

Figure 3   Instrument Report

```
********************************************************
* PERFORMANCE PARAMETER REPORT    START TIME : 08-SEP-1984 13:24:56
*                                 STOP TIME  : 08-SEP-1984 24:00:00
********************************************************

              +++++++++++++++++++++++++
              + EFFECTIVENESS PARAMETERS +
              +++++++++++++++++++++++++

PRODUCTIVITY DATA

SYSTEM THROUGHPUT

   TYPE      USER      JOB NAME    RECORDS   ELAPSED TIME

   PRINT     BAILOR    MERGDATA      10      00:01:04.08
   PRINT     DNET      THESIS        20      00:02:10.59
   PRINT     PANGMAN   CALCFRM       10      00:00:22.95
   PRINT     SYSTEM    SYE           20      00:00:34.58
   PROCESS   BAILOR                  30      02:03:44.61
   PROCESS   EE446                   20      00:20:52.94
   PROCESS   DNET                    20      02:49:56.27
   PROCESS   PANGMAN                 20      02:28:10.90

INTEGRITY DATA

DEVICE ERRORS

   DEVICE    HARD    SOFT    ERRORS THIS SESSION

   _DMA0:     1.
   _DMA1:             2.
   _DUA1:    92.    130.
   _DUA2:    33.     51.

SYSTEM ERROR SUMMARY

   DEVICE ERROR BIT SET    1.
   SYSTEM START-UP         3.

SECURITY DATA

LOGIN FAILURES BY USER

   USER     ACCESS ATTEMPTS

   <LOGIN>        2
```

Figure 4 Measurement Report

Bibliography

1. Bailor, Capt Paul D. <u>Development of a Data Base Management System Performance Monitor</u>. MS thesis, AFIT/GCS/EE/83D-2. School of Engineering, Air Force Institute of Technology (AU), Wright-Patterson AFB OH, December 1983.

2. Cincom Systems Inc. <u>Publication Number P10-0002-01</u>. Canada: Cincom Systems Inc., 1979.

3. Date, C. J. <u>An Introduction to Database Systems</u>. Reading: Addison-Wesley Publishing Company, 1982.

4. <u>Hardware Handbook</u>. Digital Equipment Corporation, Maynard MA, December 1980.

5. Kroenke, David. <u>Database Processing: Fundamentals, Modeling, Applications</u>. Chicago: Science Research Associates, Inc., 1977.

6. Milne, Rob. Lecture materials and Software Engineering Notes distributed in EE 5.93, Software Engineering. School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB OH, 1984.

7. Peters, Lawerence J. <u>Software Design: Methods and Techniques</u>. New York: Yourdon Press, 1981.

8. Pressman, Roger S. <u>Software Engineering: A Practitioner's Approach</u>. New York: McGraw-Hill Book Company, 1982.

9. Senn, James A. <u>Information Systems in Management</u>. Belmont: Wadsworth Publishing Company, Inc., 1978.

10. Sprague, Ralph H., Jr. and Eric D. Carlson. <u>Building Effective Decision Support Systems</u>. Englewood Cliffs: Prentice-hall, Inc., 1982.

11. <u>VAX/VMS Summary Description and Glossary</u>. Digital Equipment Corporation, Maynard MA, December 1982.

12. <u>VAX-11 Pascal User's Guide</u>. Digital Equipment Corporation, Maynard MA, December 1981.

13. <u>VAX-11 Utilities Reference Manual</u>. Digital Equipment Corporation, Maynard MA, December 1982.

14.   Wiederhold Gio.   Database   Design.   New   York:
McGraw-Hill Book Company, 1977.

16.   Zelkowitz,   Marvin V.   and others.   Principles of
Software Engineering and Design. Englewood Cliffs: Prentice-
Hall Inc., 1979.

<u>Vita</u>

Captain Timothy D. Bruner was born on 17 June 1949 in Springfield, Ohio. He graduated from high school in Springfield, Ohio in 1967. He enlisted in the United States Air Force in December 1970. While enlisted, he served as a 99125, Special Electronic Technician. He received a Bachelor of Science degree in Computer Science at Colorado State University in May 1979. He received a commission in August 1979. He served as a 5135 Computer Systems Analyst at the Foreign Technology Division, Wright-Patterson AFB, Ohio from August 1979 to May 1983. He entered the Air Force Institute of Technology in June 1983.

Permanent Address: 2758 Elm Drive
Springfield, Ohio 45504

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION	1b. RESTRICTIVE MARKINGS
UNCLASSIFIED	

2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT
	Approved for public release; distribution unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	

4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S)
AFIT/GCS/ENG/84D-6	

6a. NAME OF PERFORMING ORGANIZATION	6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
School of Engineering	AFIT/ENG	

6c. ADDRESS (City, State and ZIP Code)	7b. ADDRESS (City, State and ZIP Code)
Air Force Institute of Technology Wright-Patterson AFB, OH 45433	

8a. NAME OF FUNDING/SPONSORING ORGANIZATION	8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER

8c. ADDRESS (City, State and ZIP Code)	10. SOURCE OF FUNDING NOS.			
	PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT NO.

11. TITLE (Include Security Classification)
See Box 19

12. PERSONAL AUTHOR(S)
Timothy D. Bruner, B.S., Capt, USAF

13a. TYPE OF REPORT	13b. TIME COVERED		14. DATE OF REPORT (Yr., Mo., Day)	15. PAGE COUNT
MS Thesis	FROM _____	TO _____	1984 Dec	295

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB. GR.	Data Base, Data Base Management System, DBMS, Computer Performance Evaluation, Performance Computer Program Documentation, Theses
09	02		

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Title: Continued Development of a Data Base Management System
         Performance Monitor

Thesis Chairman: Dr. Gary B. Lamont
                   Professor of Electrical Engineering

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS ☐	UNCLASSIFIED

22a. NAME OF RESPONSIBLE INDIVIDUAL	22b. TELEPHONE NUMBER (Include Area Code)	22c. OFFICE SYMBOL
Dr. Gary B. Lamont	513-255-3450	AFIT/ENG

DD FORM 1473, 83 APR   EDITION OF 1 JAN 73 IS OBSOLETE.

This investigation focuses on the problem of analyzing the performance data collected on a Data Base Management System (DBMS). The performance data parameters are categorized and presented to the user using a Data Support System (DSS).

The generalized design for a DBMS performance monitor was used to design a user-friendly interface to DBMS performance data. The user interface to the DBMS performance monitor uses menus to allow the user to select DBMS performance parameter values. The DBMS performance parameter values can also be printed in the form of a performance report.

The design was implemented on a VAX 11/780 computer system using the VMS operating system. The TOTAL DBMS was used to collect performance data. The performance values were collected using existing software monitors, job accounting, system error log, and a utility developed at AFIT to collect Data Manipulation Language (DML) response performance data. *Originate - supplied keywords included: → front*

END

FILMED

4-85

DTIC